VOL 2

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PRELIMINARY DRAFT

TONOPAH STUDY AREA GRAZING ENVIRONMENTAL STATEMENT

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
BATTLE MOUNTAIN DISTRICT
NEVADA

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APPENDICES

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APPENDIX A

GRAZING ALLOTMENTS AND SYSTEMS

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The first portion of the Appendix A shows a schematic diagram and grazing schedule and an illustration for each allotment in the Tonopah study area. The allotments are: Blue Eagle, Butterfield Springs, Nyala, Reveille, Hot Creek, Wagon Johnnie, Stone Cabin, Ralston-Monitor, Hunt's Canyon, Francisco, Darrough Hot Springs, Ione, San Antone-Smoky, and Willow Creek.

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TABLE A-1
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 1

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Blue Eagle	P1	8,460	235		8,460				235
	P2	12,130	240			12,130			235
	P3	3,390	243	3,390					-0-
	PW1	9,020	254				9,020		235
	PW2	11,560	250					11,560	235
Butterfield Springs	P1	40,000	39	40,000					-0-
	P2	19,800	255		19,800				255
	PW1	62,320	1,078			62,320			1,078
	PW2	26,080	873				26,080		874
Nyala	P1	104,315	2,597			104,315			2,600
	P2	51,929	2,617					51,929	2,600
	P3	53,991	2,657		53,991				2,600
	P4	114,190	2,697				114,190		2,600
Reveille	P1	237,522	6,900		237,522				4,800
	P2	133,925	5,239			133,925			4,800
	P3	141,320	4,809					141,320	4,800
	P4	106,878	4,843	106,878					-0-
Hot Creek	P1	108,499	2,146				108,499		2,150
	P2	103,254	3,203					103,254	3,200
	P3	199,665	9,754		199,665				3,200C 6,205S
	P4	110,437	2,250			110,437			2,150
	P5	46,433	2,147	46,433					-0-
Wagon Johnnie*	P1	22,560	1,746		22,560				1,500
	P2	41,160	1,520			41,160			1,500
	P3	41,870	1,242			41,870			1,168
	P4	20,190	1,346	20,190					-0-
Stone Cabin	P1	127,795	3,570					127,795	3,524
	P2	82,060	3,524					82,060	3,524
	P3	37,040	1,231		37,040				1,267
	P4	34,120	1,260			34,120			1,043
	P5	55,560	1,232				55,560		1,043
	P6	44,000	1,254	44,000					-0-

LAND ACQUISITION

TABLE A-1
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 1

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Ralston-Monitor	PM1	19,494	714				19,494		709
	PM2	53,455	709	53,455					-0-
	PM3	11,639	701			11,639			709
	PM4	18,992	1,083			18,992			709
	PR1	195,356	4,943					195,356	4,795
	PR2	84,110	4,794	84,110					-0-
	PR3	192,651	5,138		192,651				4,795
Hunts Canyon	P1	67,450	1,011					67,450	928
	P2	52,790	966		52,790				928
	P3	40,247	933					40,247	928
	P4	13,110	121				13,110		121
Francisco	P1	5,939	240		5,939				240
	P2	3,616	246			3,616			240
	P3	4,340	237					4,340	240
	P4	3,436	235	3,436					-0-
Darrough Hot Springs	P1	3,380	383			3,380			396
	P2	4,130	383				4,130		396
	P3	3,420	383		3,420				340
	P4	4,020	102	4,020					-0-
Ione	P1	65,280	3,167C 3,368S					65,280	2,608C 923S
	P2	56,320	3,096C 1,895S					56,320	1,863C 1,538S
	P3	69,499	3,089C 1,875S	69,499					-0-
San Antone-Smoky	P1	279,532	8,450		279,532				7,488
	P2	553,856	10,730					553,856	7,488
	P3	389,760	7,488	389,760					-0-

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TABLE A-1
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 1

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Willow Creek	P1	22,520	1,431				22,520		250
	P2	26,593	1,497			26,593			610
Totals		*4,456,408	129,316C	865,171	1,113,370	604,497	372,603	1,500,767	89,997C
			13,343S						8,666S
Percent of Total Area and AUMs				19%	25%	14%	8%	34%	69%

NOTE: Abbreviations used in this table are:
P = Pasture
PW = Pasture (winter)
PM = Pasture (Monitor)
PR = Pasture (Ralston)

{ Inclusive pastures in a system

* Excludes 4,140 acres in pasture 5 of Wagon Johnnie allotment.

PRELIMINARY DRAFT

TABLE A-2
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 2

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Blue Eagle	P1	8,460	235			8,460			235
	P2	12,130	240	12,130					-0-
	P3	3,390	243		3,390				235
	PW1	9,020	254					9,020	235
	PW2	11,560	250				11,560		235
Butterfield Springs	P1	40,000	39		40,000				255
	P2	19,800	255	19,800					-0-
	PW1	62,320	1,078			62,320			1,078
	PW2	26,080	873				26,080		874
Nyala	P1	104,315	2,597					104,315	2,600
	P2	51,929	2,617		51,929				2,600
	P3	53,991	2,657				53,991		2,600
	P4	114,190	2,697			114,190			2,600
Reveille	P1	237,522	6,900			237,522			4,800
	P2	133,925	5,239					133,925	4,800
	P3	141,320	4,809	141,320					-0-
	P4	106,878	4,843		106,878				4,800
Hot Creek	P1	108,499	2,146		108,499				2,150
	P2	103,254	3,203				103,254		3,200
	P3	199,665	9,754					199,665	3,200C 6,205S
	P4	110,437	2,250	110,437					-0-
	P5	46,433	2,147			46,433			2,150
Wagon Johnnie*	P1	22,560	1,746			22,560			1,500
	P2	41,160	1,520			41,160			1,500
	P3	41,870	1,242	41,870					-0-
	P4	20,190	1,346		20,190				1,334
Stone Cabin	P1	127,795	3,570					127,795	3,524
	P2	82,060	3,524					82,060	3,524
	P3	37,040	1,231			37,040			1,043
	P4	34,120	1,260				34,120		1,043
	P5	55,560	1,232	55,560					-0-
	P6	44,000	1,254		44,000				1,267

PRELIMINARY DRAFT

TABLE A-2
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 2

Allotment	Total Acres		AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Ralston-Monitor	PM1	19,494	714	19,494					-0-
	PM2	53,455	709			53,455			709
	PM3	11,639	701			11,639			709
	PM4	18,992	1,083					18,992	709
	PR1	195,356	4,943	195,356					-0-
	PR2	84,110	4,794		84,110				4,795
	PR3	192,651	5,138					192,651	4,795
Hunts Canyon	P1	67,450	1,011		67,450				928
	P2	52,790	966					52,790	928
	P3	40,247	933					40,247	928
	P4	13,110	121				13,110		121
Francisco	P1	5,939	240			5,939			240
	P2	3,616	246					3,616	240
	P3	4,340	237	4,340					-0-
	P4	3,436	235		3,436				240
Darrough Hot Springs	P1	3,380	383				3,380		396
	P2	4,130	383		4,130				340
	P3	3,420	383			3,420			396
	P4	4,020	102		4,020				51
Ione	P1	65,280	3,167C 3,368S					65,290	1,863C 1,538S
	P2	56,320	3,096C 1,895S	56,320					-0- -0-
	P3	69,499	3,089C 1,875S					69,499	2,608C 923S
San Antone-Smoky	P1	279,532	8,450					279,532	7,488
	P2	553,856	10,730	553,856					-0-
	P3	389,760	7,488		389,760				7,488

PRELIMINARY DRAFT

TABLE A-2
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 2

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Willow Creek	P1	22,520	1,431	25,520					-0-
	P2	26,593	1,497			26,593			858
		*4,456,408	129,316C	1,233,003	927,792	670,731	245,495	1,379,387	90,212C
Totals			13,343S						8,666S
Percent of Total Area and AUMs				28%	21%	15%	5%	31%	69%

NOTE: Abbreviations used in this table are:
P = Pasture
PW = Pasture (winter)
PM = Pasture (Monitor)
PR = Pasture (Raltson)
{ Inclusive pastures in a system

* Excludes 4,140 acres in pasture 5 of Wagon Johnnie allotment.

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TABLE A-3
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 3

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Blue Eagle	P1	8,460	235	8,460					-0-
	P2	12,130	240		12,130				235
	P3	3,390	243			3,390			235
	PW1	9,020	254				9,020		235
	PW2	11,560	250					11,560	235
Butterfield Springs	P1	40,000	39	40,000					-0-
	P2	19,800	255		19,800				255
	PW1	62,320	1,078			62,320			1,078
	PW2	26,080	873				26,080		874
Nyala	P1	104,315	2,597		104,315				2,600
	P2	51,929	2,617				51,929		2,600
	P3	53,991	2,657			53,991			2,600
	P4	114,190	2,697					114,190	2,600
Reveille	P1	237,522	6,900					237,522	4,800
	P2	133,925	5,239	133,925					-0-
	P3	141,320	4,809		141,320				4,800
	P4	106,878	4,843			106,878			4,800
Hot Creek	P1	108,499	2,146					108,499	2,150
	P2	103,254	3,203		103,254				3,200
	P3	199,665	9,754				199,665		3,200C 6,205S
	P4	110,437	2,250			110,437			2,150
	P5	46,433	2,147	46,433					-0-
Wagon Johnnie*	P1	22,560	1,746			22,560			1,500
	P2	41,160	1,520	41,160					-0-
	P3	41,870	1,242		41,870				1,168
	P4	20,190	1,346			20,190			1,334
Stone Cabin	P1	127,795	3,570					127,795	3,524
	P2	82,060	3,524					82,060	3,524
	P3	37,040	1,231				37,040		1,043
	P4	34,120	1,260	34,120					-0-
	P5	55,560	1,232		55,560				1,267
	P6	44,000	1,254			44,000			1,043

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TABLE A-3
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 3

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Ralston-Monitor	PM1	19,494	714			19,494			709
	PM2	53,455	709			53,455			709
	PM3	11,639	701				11,639		709
	PM4	18,992	1,083	18,992					-0-
	PR1	195,356	4,943		195,356				4,795
	PR2	84,110	4,794					84,110	4,795
	PR3	192,651	5,138	192,651					-0-
Hunts Canyon	P1	67,450	1,011					67,450	928
	P2	52,790	966					52,790	928
	P3	40,247	933		40,247				928
	P4	13,110	121				13,110		121
Francisco	P1	5,939	240					5,939	240
	P2	3,616	246	3,616					-0-
	P3	4,340	237		4,340				240
	P4	3,436	235			3,436			240
Darrough Hot Springs	P1	3,380	383		3,380				340
	P2	4,130	383			4,130			396
	P3	3,420	383				3,420		396
	P4	4,020	102	4,020					-0-
Ione	P1	65,280	3,167C 3,368S	65,280					-0- -0-
	P2	56,320	3,096C 1,895S					56,320	2,608C 923S
	P3	69,499	3,089C 1,875S					69,499	1,863C 1,538S
San Antone-Smoky	P1	279,532	8,450	279,532					-0-
	P2	553,856	10,730		553,856				7,488
	P3	389,760	7,488					389,760	7,488

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TABLE A-3
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 3

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Willow Creek	P1	22,520	1,431			22,520			610
	P2	26,593	1,497				26,593		250
Totals		*4,456,408	129,316C	868,189	1,275,428	526,801	378,496	1,407,494	89,831C
			13,343S						8,666S
Percent of Total Area and AUMs				19%	29%	12%	8%	32%	69%

NOTE: Abbreviations used in this table are:
P -= Pasture
PW = Pasture (winter)
PM = Pasture (Monitor)
PR = Pasture (Ralston)

{ Inclusive pastures in a system

* Excludes 4,140 acres in pasture 5 of Wagon Johnnie allotment.

PRELIMINARY DRAFT

TABLE A-4
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 4

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Blue Eagle	P1	8,460	235		8,460				235
	P2	12,130	240			12,130			235
	P3	3,390	243	3,390					-0-
	PW1	9,020	254					9,020	235
	PW2	11,560	250					11,560	235
Butterfield Springs	P1	40,000	39		40,000				255
	P2	19,800	255	19,800					-0-
	PW1	62,320	1,078			62,320			1,078
	PW2	26,080	873				26,080		874
Nyala	P1	104,315	2,597				104,315		2,600
	P2	51,929	2,617			51,929			2,600
	P3	53,991	2,657					53,991	2,600
	P4	114,190	2,697		114,190				2,600
Reveille	P1	237,522	6,900	237,522					-0-
	P2	133,925	5,239		133,925				4,800
	P3	141,320	4,809			141,320			4,800
	P4	106,878	4,843					106,878	4,800
Hot Creek	P1	108,499	2,146				108,499		2,150
	P2	103,254	3,203					103,254	3,200
	P3	199,665	9,754		199,665				3,200C 6,205S
	P4	110,437	2,250	110,437					-0-
	P5	46,433	2,147			46,433			2,150
Wagon Johnnie*	P1	22,560	1,746	22,560					-0-
	P2	41,160	1,520		41,160				1,500
	P3	41,870	1,242			41,870			1,168
	P4	20,190	1,346			20,190			1,334
Stone Cabin	P1	127,795	3,570					127,795	3,524
	P2	82,060	3,524					82,060	3,524
	P3	37,040	1,231	37,040					-0-
	P4	34,120	1,260		34,120				1,267
	P5	55,560	1,232			55,560			1,043
	P6	44,000	1,254				44,000		1,043

PRELIMINARY DRAFT

TABLE A-4
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 4

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Ralston-Monitor	PM1	19,494	714			19,494			709
	PM2	53,455	709				53,455		709
	PM3	11,639	701	11,639					-0-
	PM4	18,992	1,083			18,992			709
	PR1	195,356	4,943					195,356	4,795
	PR2	84,110	4,794	84,110					-0-
	PR3	192,651	5,138		192,651				4,795
Hunts Canyon	P1	67,450	1,011					67,450	928
	P2	52,790	966					52,790	928
	P3	40,247	933		40,247				928
	P4	13,110	121				13,110		121
Francisco	P1	5,939	240	5,939					-0-
	P2	3,616	246		3,616				240
	P3	4,340	237			4,340			240
	P4	3,436	235					3,436	240
Darrough Hot Springs	P1	3,380	383			3,380			340
	P2	4,130	383				4,130		396
	P3	3,420	383		3,420				396
	P4	4,020	102		4,020				51
Ione	P1	65,280	3,167C 3,368S					65,280	2,608C 923S
	P2	56,320	3,096C 1,895S					56,320	1,863C 1,538S
	P3	69,499	3,089C 1,875S	69,499					-0- -0-
San Antone-Smoky	P1	279,532	8,450		279,532				7,488
	P2	553,856	10,730					553,856	7,488
	P3	389,760	7,488	389,760					-0-

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TABLE A-4
ACRES RESTED AND GRAZED BY LIVESTOCK YEAR 4

Allotment		Total Acres	AUMs Available	Acres Rested Yearlong	Acres Grazed By Season				
					Spring	Summer	Fall	Winter	AUMs Used
Willow Creek	P1	22,520	1,431			22,520			858
	P2	26,593	1,497	26,593					
Totals		*4,456,408	129,316C	1,018,289	1,095,006	500,478	353,589	1,489,046	89,880C
			13,343S						8,666S
Percent of Total Area and AUMs				23%	25%	11%	8%	33%	69%

NOTE: Abbreviations used in this table are:
P = Pasture
PW = Pasture (winter)
PM = Pasture (Monitor)
PR = Pasture (Ralston)
{ Inclusive pastures in a system

* Excludes 4,140 acres in pasture 5 of Wagon Johnnie allotment.

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A-4

APPENDIX B

CLIMATE

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Illustration B-1. Weather Station Locations. Shown on half a page map, the seven reporting stations within the Tonopah study area.

Table B-1. Weather Station Descriptions. Gives detailed information on the representativeness, elevation, latitude-longitude, and period of record for the following weather stations: Currant Highway, Adaven, Rattlesnake, Stone Cabin Valley, Tonopah Airport, Smoky Valley, and Ione.

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TABLE B-2

PRECIPITATION MEANS AND PROBABILITIES FOR 1-WEEK PERIOD
ADAVEN, NEVADA

Period Begins	Mean Pcpn	Prob O-T	Probability (Percent) of Receiving at Least the Following Amounts (In) of Precipitation								
			0.06	0.10	0.20	0.40	0.60	0.80	1.00	1.40	2.00
Mar 01	.36	42	53	50	42	31	23	17	12	7	3
Mar 08	.43	41	52	48	41	30	23	17	13	8	3
Mar 15	.32	40	52	48	40	28	20	14	10	5	2
Mar 22	.26	39	53	49	39	26	18	12	8	4	1
Mar 29	.37	40	52	47	38	26	18	12	9	4	2
Apr 05	.21	48	43	39	31	20	13	8	6	3	1
Apr 12	.10	57	35	31	24	14	8	5	3	1	
Apr 19	.19	48	45	42	34	22	15	10	6	3	1
Apr 26	.50	44	52	49	42	30	21	15	11	5	2
May 03	.18	57	39	36	30	21	15	11	8	4	2
May 10	.14	59	34	31	24	15	10	6	4	2	
May 17	.21	58	37	33	25	15	9	5	3	1	
May 24	.08	61	36	33	25	14	9	6	4	2	1
May 31	.34	62	34	31	25	16	11	8	6	4	2
Jun 07	.09	68	27	24	18	11	8	5	4	2	1
Jun 14	.06	74	21	18	12	4	2	1			
Jun 21	.03	75	20	17	11	4	2	1			
Jun 28	.09	72	23	20	14	7	4	2	1		
Jul 05	.11	63	30	27	20	12	7	4	3	1	
Jul 12	.22	54	38	35	27	17	11	7	5	2	1
Jul 19	.24	45	48	44	36	24	16	10	7	3	1
Jul 26	.35	38	56	51	42	29	20	14	9	5	1
Aug 02	.37	34	59	54	45	30	21	14	10	5	2
Aug 09	.29	36	58	54	44	30	20	13	9	4	1
Aug 16	.34	48	48	45	38	26	18	12	8	4	1
Aug 23	.16	62	35	33	28	19	13	9	6	3	1
Aug 30	.16	68	29	27	22	14	8	5	3	1	
Sep 06	.08	76	21	20	16	10	6	4	2	1	
Sep 13	.08	78	19	18	15	10	7	4	3	1	
Sep 20	.16	74	23	22	19	13	9	6	3	1	
Sep 27	.12	72	25	24	20	14	10	7	4	2	
Oct 04	.20	68	29	27	23	16	11	8	5	2	1
Oct 11	.16	68	29	28	24	17	12	9	6	3	2
Oct 18	.28	70	28	27	24	17	11	8	6	4	2
Oct 25	.13	69	29	28	24	15	9	6	4	3	2
Nov 01	.18	67	30	28	24	17	11	8	6	4	2
Nov 08	.32	60	36	34	29	21	16	12	9	5	2
Nov 15	.24	59	37	35	29	21	14	10	7	4	1
Nov 22	.15	64	33	31	26	19	13	9	6	3	1
Nov 29	.28	63	35	33	27	19	13	9	6	3	1
Dec 06	.10	61	35	32	26	16	10	6	4	2	
Dec 13	.20	57	38	35	28	19	12	8	6	3	1
Dec 20	.33	49	46	43	37	27	20	14	10	5	2
Dec 27	.39	48	49	47	40	29	21	15	11	6	2
Jan 03	.22	46	50	47	39	27	18	13	9	4	1
Jan 10	.37	41	52	48	40	28	20	14	10	5	2
Jan 17	.37	39	52	48	40	29	21	15	11	6	3
Jan 24	.30	38	54	50	42	30	22	16	12	6	3
Jan 31	.49	30	62	57	48	35	26	19	14	7	3
Feb 07	.40	27	64	59	49	34	23	16	11	6	2
Feb 14	.26	36	57	53	44	29	19	13	8	4	1
Feb 21	.35	42	54	51	43	30	21	14	10	5	1

Source: After Gifford, et al., Precipitation Probabilities for Western States, 1967.

PRELIMINARY DRAFT

TABLE B-3.

PRECIPITATION MEANS AND PROBABILITIES FOR 1-WEEK PERIODS
ARVADA, COLORADO

Period Begins	Mean Prec.	Probability (Percent) of Receiving at Least the Following Amounts (IN) of Precipitation									
		0.01	0.10	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
Mar 01	.24	42	32	20	12	8	4	2	1	1	0
Mar 08	.45	41	32	18	11	6	4	2	1	1	0
Mar 15	.27	40	32	16	10	6	3	2	1	0	0
Mar 22	.26	39	31	15	9	5	3	2	1	0	0
Mar 29	.27	40	32	17	10	6	3	2	1	0	0
Apr 05	.21	38	30	14	8	5	3	2	1	0	0
Apr 12	.10	27	19	9	5	3	2	1	0	0	0
Apr 19	.19	38	29	14	8	5	3	2	1	0	0
Apr 26	.20	34	27	13	8	5	3	2	1	0	0
May 03	.18	32	25	12	7	4	3	2	1	0	0
May 10	.14	29	21	9	5	3	2	1	0	0	0
May 17	.21	34	27	13	8	5	3	2	1	0	0
May 24	.08	21	13	5	3	2	1	0	0	0	0
May 31	.24	41	34	19	12	8	5	3	2	1	0
Jun 07	.09	24	17	7	4	2	1	0	0	0	0
Jun 14	.20	34	27	13	8	5	3	2	1	0	0
Jun 21	.03	15	9	3	2	1	0	0	0	0	0
Jun 28	.03	17	11	4	2	1	0	0	0	0	0
Jul 05	.11	30	20	8	4	2	1	0	0	0	0
Jul 12	.22	38	27	13	7	4	2	1	0	0	0
Jul 19	.24	42	30	14	8	5	3	2	1	0	0
Jul 26	.15	34	24	10	6	3	2	1	0	0	0
Aug 02	.27	39	29	14	8	5	3	2	1	0	0
Aug 09	.29	39	29	14	8	5	3	2	1	0	0
Aug 16	.24	36	26	12	7	4	2	1	0	0	0
Aug 23	.19	32	23	10	6	3	2	1	0	0	0
Aug 30	.15	28	20	8	4	2	1	0	0	0	0
Sep 06	.09	23	16	6	3	2	1	0	0	0	0
Sep 13	.08	22	15	6	3	2	1	0	0	0	0
Sep 20	.16	29	21	9	5	3	2	1	0	0	0
Sep 27	.11	25	17	7	4	2	1	0	0	0	0
Oct 04	.20	34	26	12	7	4	2	1	0	0	0
Oct 11	.16	29	21	9	5	3	2	1	0	0	0
Oct 18	.20	32	24	11	6	4	2	1	0	0	0
Oct 25	.11	25	17	7	4	2	1	0	0	0	0
Nov 01	.18	30	22	10	6	3	2	1	0	0	0
Nov 08	.22	34	26	12	7	4	2	1	0	0	0
Nov 15	.24	36	27	13	8	5	3	2	1	0	0
Nov 22	.15	29	20	8	4	2	1	0	0	0	0
Nov 29	.24	36	27	13	8	5	3	2	1	0	0
Dec 06	.10	27	19	8	4	2	1	0	0	0	0
Dec 13	.24	36	27	13	8	5	3	2	1	0	0
Dec 20	.17	30	22	10	6	3	2	1	0	0	0
Dec 27	.20	32	24	11	6	4	2	1	0	0	0
Jan 03	.22	34	26	12	7	4	2	1	0	0	0
Jan 10	.17	30	22	10	6	3	2	1	0	0	0
Jan 17	.17	30	22	10	6	3	2	1	0	0	0
Jan 24	.20	32	24	11	6	4	2	1	0	0	0
Jan 31	.10	27	19	8	4	2	1	0	0	0	0
Feb 07	.40	47	37	21	13	8	5	3	2	1	0
Feb 14	.25	37	28	14	8	5	3	2	1	0	0
Feb 21	.25	37	28	14	8	5	3	2	1	0	0

Source: After Miller, et al., Precipitation Probabilities for Weather
Modification, 1964.

TABLE B-3
PRECIPITATION MEANS AND PROBABILITIES FOR 2-WEEK PERIOD
ADAVEN, NEVADA

Period Begins	Mean Pcpn	Prob O-T	Probability (Percent) of Receiving at Least the Following Amounts (In) of Precipitation								
			0.06	0.10	0.20	0.40	0.60	1.00	1.40	2.00	4.00
Mar 01	.80	19	74	70	62	50	41	27	18	10	2
Mar 15	.58	13	78	74	64	49	37	22	13	6	
Mar 29	.59	17	73	68	58	42	31	18	10	4	
Apr 12	.29	28	63	58	48	34	24	12	6	2	
Apr 26	.68	24	70	67	59	45	35	21	13	6	
May 10	.36	36	56	51	42	29	20	10	5	2	
May 24	.42	38	56	52	44	32	23	13	7	3	
Jun 07	.15	49	42	38	28	17	10	5	3	1	
Jun 21	.13	54	38	34	24	12	6	2	1		
Jul 05	.33	37	55	51	42	29	20	10	5	2	
Jul 19	.59	18	75	71	62	47	36	21	12	5	
Aug 02	.67	12	81	77	67	52	40	24	14	7	
Aug 16	.51	33	62	59	52	40	30	18	10	4	
Aug 30	.25	55	42	39	33	23	16	7	3	1	
Sep 13	.25	58	37	35	29	21	15	7	4	1	
Sep 27	.33	50	46	44	38	28	21	11	6	2	
Oct 11	.45	48	49	47	41	32	25	15	9	4	
Oct 25	.32	47	49	46	40	30	23	13	8	4	
Nov 08	.56	38	59	57	52	41	31	18	10	4	
Nov 22	.43	38	57	54	47	35	26	14	7	3	
Dec 06	.31	38	59	56	49	35	24	12	6	2	
Dec 20	.73	27	70	68	62	50	40	25	15	7	
Jan 03	.60	26	70	67	60	48	38	23	14	7	1
Jan 17	.68	18	77	73	65	52	42	26	17	8	1
Jan 31	.89	8	86	83	74	59	47	30	18	9	1
Feb 14	.61	13	83	80	71	55	41	23	12	5	

Source: After Gifford, et al., Precipitation Probabilities for Western States, 1967.

PRELIMINARY DRAFT

TABLE B-4

PRECIPITATION MEANS AND PROBABILITIES FOR 3-WEEK PERIOD
ADAVEN, NEVADA

Period Begins	Mean Pcpn	Prob 0-T	Probability (Percent) of Receiving at Least the Following Amounts (In) of Precipitation								
			0.06	0.10	0.20	0.40	0.60	1.00	1.40	2.00	4.00
Mar 01	1.12	8	86	82	75	63	53	38	28	18	4
Mar 22	.85	5	88	84	75	61	48	31	20	10	1
Apr 12	.80	13	82	78	70	55	43	27	17	8	1
May 03	.54	21	73	70	61	47	35	20	5		
May 24	.51	25	67	63	55	42	32	19	11	5	
Jun 14	.19	37	54	48	35	18	10	3	1		
Jul 05	.57	20	75	71	63	49	37	21	12	5	
Jul 26	1.02	8	89	86	80	67	56	38	26	14	2
Aug 16	.67	28	70	68	62	50	39	24	14	7	
Sep 06	.33	48	47	45	39	29	21	12	6	3	
Sep 27	.50	34	62	60	53	42	32	19	12	5	
Oct 18	.60	30	65	62	55	44	35	22	14	7	1
Nov 08	.71	26	72	70	65	54	44	27	17	8	
Nov 29	.60	26	71	69	63	50	39	22	12	5	
Dec 20	.96	17	81	79	74	64	54	37	25	14	2
Jan 10	1.05	12	85	83	78	67	57	41	28	16	2
Jan 31	1.15	3	94	91	85	73	61	43	29	17	3

Source: After Gifford, et al., Precipitation Probabilities for Western States, 1967.

PRELIMINARY DRAFT

PRELIMINARY DRAFT

TABLE B-5
PRECIPITATION MEANS AND PROBABILITIES FOR 1-WEEK PERIOD
TONOPAH AIRPORT, NEVADA

Period Begins	Mean Pcpn	Prob 0-T	Probability (Percent) of Receiving at Least the Following Amounts (In) of Precipitation								
			0.06	0.10	0.20	0.40	0.60	0.80	1.00	1.40	2.00
Mar 01	.11	51	40	33	21	8	3	1			
Mar 08	.08	49	39	32	20	8	3	1			
Mar 15	.14	53	37	32	22	11	5	3	2		
Mar 22	.14	58	34	29	21	11	6	4	2	1	
Mar 29	.09	62	31	27	19	10	5	3	2		
Apr 05	.14	65	29	26	19	10	5	3	2		
Apr 12	.08	65	29	26	18	10	5	3	1		
Apr 19	.12	57	36	32	23	12	6	3	2		
Apr 26	.19	55	39	34	26	14	7	4	2		
May 03	.07	60	31	27	20	10	5	3	2		
May 10	.12	57	29	24	16	8	4	2	1		
May 17	.08	57	29	24	16	7	4	2	1		
May 24	.08	60	29	24	16	7	3	1	1		
May 31	.10	65	28	24	16	7	3	1			
Jun 07	.06	74	20	17	11	5	2	1			
Jun 14	.01	75	13	8	4	2	1				
Jun 21	.02	73	11	5	1						
Jun 28	0.00	78	10	6	3	2	1	1			
Jul 05	.07	74	16	13	9	5	3	2	1		
Jul 12	.09	63	28	24	17	9	5	3	2		
Jul 19	.16	57	36	31	22	11	6	3	2		
Jul 26	.09	57	34	29	20	9	4	2	1		
Aug 02	.09	62	29	25	17	8	4	2	1		
Aug 09	.13	68	24	21	15	8	5	3	2		
Aug 16	.02	75	18	15	10	5	3	2	1		
Aug 23	.07	77	17	15	11	6	3	2	1		
Aug 30	.10	77	20	18	14	8	5	3	2	1	
Sep 06	.07	82	15	14	11	7	4	3	2	1	
Sep 13	.03	80	14	12	9	6	3	2	2	1	
Sep 20	.10	73	19	16	12	7	4	3	2	1	
Sep 27	.08	72	22	19	14	8	5	3	2	1	
Oct 04	.10	68	26	23	16	8	4	2	1		
Oct 11	.08	63	29	24	17	9	5	3	2	1	
Oct 18	.15	65	28	25	18	11	7	4	3	1	
Oct 25	.11	68	26	23	18	10	6	4	2	1	
Nov 01	.08	69	24	22	16	9	6	4	2	1	
Nov 08	.15	63	28	24	17	10	6	4	2	1	
Nov 15	.08	61	28	23	14	6	3	2	1		
Nov 22	.03	66	23	18	10	3	1				
Nov 29	.08	64	26	20	11	3	1				
Dec 06	.05	63	27	21	11	3	1				
Dec 13	.06	58	29	23	12	4	1				
Dec 20	.10	48	36	29	17	7	3	1			
Dec 27	.12	51	36	29	17	7	3	2	1		
Jan 03	.04	54	34	26	13	4	2	1			
Jan 10	.10	47	37	28	15	4	1				
Jan 17	.08	44	37	29	16	5	2				
Jan 24	.08	48	39	30	16	4	1				
Jan 31	.09	47	40	31	16	4	1				
Feb 07	.07	44	40	29	13	2					
Feb 14	.07	47	39	20	14	3	1				
Feb 21	.11	52	39	33	19	7	2	1			

Source: After Gifford, et al., Precipitation Probabilities for Western States, 1967.

PRELIMINARY DRAFT

TABLE B-6
PRECIPITATION MEANS AND PROBABILITIES FOR 2-WEEK PERIOD
TONOPAH AIRPORT, NEVADA

Period Begins	Mean Pcpn	Prob O-T	Probability (Percent) of Receiving at Least the Following Amounts (In) of Precipitation								
			0.06	0.10	0.20	0.40	0.60	1.00	1.40	2.00	4.00
Mar 01	.20	35	57	51	38	20	10	3	1		
Mar 15	.28	37	52	47	37	23	15	6	3	1	
Mar 29	.23	42	49	44	34	21	13	5	2		
Apr 12	.21	40	52	47	36	22	14	5	2		
Apr 26	.27	41	53	49	40	25	16	6	2		
May 10	.20	36	46	40	29	16	10	4	2		
May 24	.18	42	48	42	31	16	8	2			
Jun 07	.08	55	31	25	16	7	3	1			
Jun 21	.03	58	21	13	5	2	1				
Jul 05	.16	49	39	35	26	15	9	3	1		
Jul 19	.26	38	55	49	38	23	13	4	1		
Aug 02	.22	43	45	40	30	17	10	4	1		
Aug 16	.10	58	32	28	21	12	7	2	1		
Aug 30	.18	64	30	28	22	14	10	4	2	1	
Sep 13	.14	57	31	27	20	13	8	4	2	1	
Sep 27	.18	48	41	37	28	16	10	4	2		
Oct 11	.24	42	48	43	33	21	13	6	2	1	
Oct 25	.19	50	43	39	31	20	13	6	3	1	
Nov 08	.24	39	45	40	29	18	11	5	2	1	
Nov 22	.11	39	44	36	22	8	3				
Dec 06	.11	35	49	40	24	9	3				
Dec 20	.23	27	57	49	34	17	8	2			
Jan 03	.14	28	55	46	30	13	5	1			
Jan 17	.16	23	62	52	33	12	5	1			
Jan 31	.16	24	64	54	32	10	3				
Feb 14	.18	26	63	54	35	14	5	1			

Source: After Gifford, et al., Precipitation Probabilities for Western States, 1967.

PRELIMINARY DRAFT

TABLE B-7
PRECIPITATION MEANS AND PROBABILITIES FOR 3-WEEK PERIOD
TONOPAH AIRPORT, NEVADA

Period Begins	Mean Pcpn	Prob O-T	Probability (Percent) of Receiving at Least the Following Amounts (In) of Precipitation								
			0.06	0.10	0.20	0.40	0.60	1.00	1.40	2.00	4.00
Mar 01	.34	25	67	62	50	32	21	8	3	1	
Mar 22	.38	27	63	58	47	31	21	10	5	2	
Apr 12	.41	28	67	63	53	36	25	11	5	1	
May 03	.27	27	59	53	42	27	18	8	4	1	
May 24	.25	29	60	54	40	22	12	4	1		
Jun 14	.04	46	31	23	12	4	1				
Jul 05	.33	31	60	55	43	27	17	7	3	1	
Jul 26	.31	26	64	59	46	29	18	7	3		
Aug 16	.20	44	46	42	32	20	13	5	2		
Sep 06	.22	47	40	36	28	18	13	6	3	1	
Sep 27	.26	33	56	51	40	26	17	7	3	1	
Oct 18	.35	34	58	54	45	31	22	11	5	2	
Nov 08	.27	26	56	49	37	23	14	6	3	1	
Nov 29	.19	23	63	54	36	15	6	1			
Dec 20	.27	15	71	63	47	25	14	4	1		
Jan 10	.27	12	75	66	47	23	11	2			
Jan 31	.25	12	78	69	47	20	8	1			

Source: After Gifford, et al., Precipitation Probabilities for Western States, 1967.

PRELIMINARY DRAFT

TABLE B-8
ADAVEN TEMPERATURE DATA

Station No. 46 — Years of Data 50
Location 38.1N 115.5W — Elevation 6,250 Ft.

Part A: Dates of Last Spring Occurrence of Low Temperature (or Lower)

Temperature F	Temperature C	Percent Chance of Later Than Indicated Date 90%	75%	50%	25%	10%
16	-9	Feb 25	Mar 11	Mar 26	Apr 10	Apr 24
20	-7	Mar 24	Apr 3	Apr 13	Apr 23	May 3
24	-4	Apr 6	Apr 16	Apr 27	May 8	May 18
28	-2	Apr 25	May 5	May 15	May 25	Jun 4
32	0	May 13	May 21	May 28	Jun 4	Jun 12
36	2	May 21	May 30	Jun 8	Jun 17	Jun 26
40	4	Jun 4	Jun 12	Jun 20	Jun 28	Jul 6

Part B: Dates of First Fall Occurrence of Low Temperature (or Lower)

Temperature F	Temperature C	Percent Chance of Earlier Than Indicated Date 10%	25%	50%	75%	90%
16	-9	Oct 30	Nov 7	Nov 15	Nov 23	Dec 1
20	-7	Oct 16	Oct 26	Nov 4	Nov 13	Nov 23
24	-4	Oct 4	Oct 13	Oct 23	Nov 2	Nov 11
28	-2	Sep 19	Sep 29	Oct 9	Oct 19	Oct 29
32	0	Sep 11	Sep 19	Sep 28	Oct 7	Oct 15
36	2	Sep 2	Sep 10	Sep 19	Sep 28	Oct 6
40	4	Aug 18	Aug 28	Sep 6	Sep 15	Sep 25

Part C: Growing Season Length (Days)

Temperature F	Temperature C	Percent Chance of Longer Than Indicated Length 10%	25%	50%	75%	90%
16	-9	268	252	235	218	202
20	-7	233	219	205	191	177
24	-4	207	193	178	163	149
28	-2	176	162	147	132	118
32	0	147	135	122	109	97
36	2	128	116	103	90	78
40	4	103	91	78	65	53

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatological Data, 1975.

PRELIMINARY DRAFT

TABLE B-1
RATTLESNAKE TEMPERATURE DATA

Station No. 6630 Years of Data 20
Location 38.5N 116.2W Elevation 5,910 Ft.

Part A: Dates of Last Spring Occurrence of Low Temperature (or Lower)

Temperature F	Temperature C	Percent Chance of Later Than Indicated Date 90%	75%	50%	25%	10%
16	-9	Feb 17	Mar 1	Mar 14	Mar 27	Apr 8
20	-7	Mar 12	Mar 21	Mar 31	Apr 10	Apr 19
24	-4	Mar 31	Apr 9	Apr 17	Apr 25	May 4
28	-2	Apr 6	Apr 17	Apr 27	May 7	May 18
32	0	May 5	May 13	May 21	May 29	Jun 6
36	2	May 19	May 26	Jun 2	Jun 9	Jun 16
40	4	May 29	Jun 3	Jun 8	Jun 13	Jun 18

Part B: Dates of First Fall Occurrence of Low Temperature (or Lower)

Temperature F	Temperature C	Percent Chance of Earlier Than Indicated Date 10%	25%	50%	75%	90%
16	-9	Nov 8	Nov 15	Nov 22	Nov 29	Dec 9
20	-7	Oct 27	Nov 4	Nov 11	Nov 18	Nov 26
24	-4	Oct 17	Oct 23	Oct 30	Nov 6	Nov 12
28	-2	Oct 6	Oct 17	Oct 23	Oct 31	Nov 9
32	0	Sep 21	Sep 29	Oct 7	Oct 15	Oct 23
36	2	Sep 14	Sep 22	Sep 30	Oct 8	Oct 16
40	4	Sep 7	Sep 14	Sep 22	Sep 30	Oct 7

Part C: Growing Season Length (Days)

Temperature F	Temperature C	Percent Chance of Longer Than Indicated Length 10%	25%	50%	75%	90%
16	-9	282	268	253	238	224
20	-7	250	238	225	212	200
24	-4	215	204	193	182	171
28	-2	204	191	177	163	150
32	0	162	151	139	127	116
36	2	142	131	120	109	98
40	4	125	115	106	97	87

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatological Data, 1975.

PRELIMINARY DRAFT

TABLE B-10
SMOKY VALLEY TEMPERATURE DATA

Station No. 7620 — Years of Data 20
Location 38.8N 117.2W — Elevation 5,630 Ft.

Part A: Dates of Last Spring Occurrence of Low Temperature (or Lower)

Temperature F	Temperature C	Percent Chance of Later Than Indicated Date 90%	75%	50%	25%	10%
16	-9	Mar 26	Apr 6	Apr 18	Apr 30	May 11
20	-7	Apr 10	Apr 18	Apr 26	May 4	May 12
24	-4	Apr 23	Apr 30	May 8	May 16	May 23
28	-2	Apr 29	May 8	May 17	May 26	Jun 4
32	0	May 21	May 26	May 31	Jun 5	Jun 10
36	2	Jun 4	Jun 11	Jun 17	Jun 23	Jun 30
40	4	Jun 16	Jun 22	Jun 28	Jul 4	Jul 10

Part B: Dates of First Fall Occurrence of Low Temperature (or Lower)

Temperature F	Temperature C	Percent Chance of Earlier Than Indicated Date 10%	25%	50%	75%	90%
16	-9	Oct 19	Oct 28	Nov 5	Nov 13	Nov 22
20	-7	Oct 6	Oct 15	Oct 25	Nov 4	Nov 13
24	-4	Sep 27	Oct 5	Oct 12	Oct 19	Oct 27
28	-2	Sep 18	Sep 25	Oct 3	Oct 11	Oct 18
32	0	Aug 31	Sep 10	Sep 19	Sep 28	Oct 8
36	2	Aug 20	Aug 29	Sep 8	Sep 18	Sep 27
40	4	Aug 6	Aug 16	Aug 25	Sep 3	Sep 13

Part C: Growing Season Length (Days)

Temperature F	Temperature C	Percent Chance of Longer Than Indicated Length 10%	25%	50%	75%	90%
16	-9	231	217	202	187	173
20	-7	207	195	182	169	157
24	-4	178	167	156	145	134
28	-2	162	150	138	126	114
32	0	131	120	109	98	87
36	2	105	94	82	70	59
40	4	80	69	58	47	36

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatological Data, 1975.

PRELIMINARY DRAFT

TABLE B-11
TONOPAH CITY TEMPERATURE DATA

Station No. 8160 Years of Data 42
Location 38.1N 117.2W Elevation 6,090 Ft.

Part A: Dates of Last Spring Occurrence of Low Temperature (or Lower)

Temperature F	Temperature C	Percent Chance of Later Than Indicated Date 90%	75%	50%	25%	10%
16	-9	Feb 3	Feb 18	Mar 5	Mar 20	Apr 4
20	-7	Mar 7	Mar 18	Mar 29	Apr 9	Apr 20
24	-4	Mar 23	Apr 3	Apr 15	Apr 27	May 8
28	-2	Apr 4	Apr 15	Apr 27	May 9	May 20
32	0	Apr 25	May 8	May 20	Jun 1	Jun 13
36	2	May 16	May 25	Jun 2	Jun 10	Jun 19
40	4	May 26	Jun 2	Jun 9	Jun 16	Jun 23

Part B: Dates of First Fall Occurrence of Low Temperature (or Lower)

Temperature F	Temperature C	Percent Chance of Earlier Than Indicated Date 10%	25%	50%	25%	10%
16	-9	Nov 6	Nov 17	Nov 28	Dec 9	Dec 20
20	-7	Oct 24	Nov 4	Nov 15	Nov 26	Dec 7
24	-4	Oct 17	Oct 26	Nov 5	Nov 15	Nov 24
28	-2	Oct 8	Oct 16	Oct 25	Nov 3	Nov 11
32	0	Sep 23	Oct 2	Oct 11	Oct 20	Oct 29
36	2	Sep 9	Sep 20	Sep 30	Oct 10	Oct 21
40	4	Aug 28	Sep 8	Sep 18	Sep 28	Oct 9

Part C: Growing Season Length (Days)

Temperature F	Temperature C	Percent Chance of Longer Than Indicated Length 10%	25%	50%	75%	90%
16	-9	305	287	268	249	231
20	-7	263	247	231	215	199
24	-4	236	221	205	189	174
28	-2	210	196	181	166	152
32	0	175	160	144	128	113
36	2	146	133	119	105	92
40	4	126	114	101	88	76

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatological Data, 1975.

PRELIMINARY DRAFT

APPENDIX C

AIR QUAILTY

PRELIMINARY
DRAFT

TABLE II- C-1

AMBIENT AIR QUALITY DATA--SUSPENDED PARTICULATES
(IN MICROGRAMS PER CUBIC METER)

PRELIMINARY DRAFT

Location (Air Quality Control Region Number)	Sample Period	Number Observations	Geometric Mean	Geometric Standard Deviation	Percent Reduction Required Nevada	Percent Reduction Required Federal	Number Over Maximum	24-Hour Concentration Maximum High	24-Hour Concentration Maximum Second High	Percent Reduction Required Federal & Nevada High	Percent Reduction Required Federal & Nevada Second High
			Ambient Air Quality Standards Geometric Mean Federal AAQS-75 ug/m^3 Nevada AAQS-60 ug/m^3					24-Hour Concentration Federal and Nevada AAQS - 150 ug/m^3			
	JAN-MAR	13	18	2.82	--	--	0	87	59	--	--
	APR-JUN	10	28		--	--	0	72	50	--	--
TONOPAH	JUL-SEP	15	28		--	--	0	71	41	--	--
(147)	OCT-DEC	10	13		--	--	0	22	20	--	--
1974	TOTAL 1974	48	20	2.03	--	--	0	87	72	--	--
	JAN-MAR	13	12	1.54	--	--	--	28	20	--	--
	APR-JUN	15	29	1.55	--	--	--	77	74	--	--
TONOPAH	JUL-SEP	14	35	1.83	--	--	1	192	54	21	--
(147)	OCT-DEC	14	18	2.53	--	--	--	91	36	--	--
1973	TOTAL 1973	56	22	2.10	--	--	1	192	91	21	--
	JAN-MAR APR-JUN	6	28	1.46	--	--	--	40	37	--	--
TONOPAH	JUL-SEP	12	28	1.36	--	--	--	48	36	--	--
(147)	OCT-DEC	13	17	1.57	--	--	--	34	28	--	--
1972	TOTAL 1972	31	23	1.57	--	--	--	48	40	--	--

Assumed background level - 25ug/m^3

SOURCE: State of Nevada, Environmental Protection Services, Air Quality Control, Carson City, Nevada.

C-2

TABLE II-C-2
AMBIENT AIR QUALITY DATA--SUSPENDED PARTICULATES (IN MICROGRAMS PER CUBIC METER)

PRELIMINARY DRAFT

Location (Air Quality Control Region Number)	Sample Period	Number Observations	Ambient Air Quality Standards Geometric Mean Federal AAQS-75 ug/m³ Nevada AAQS-60 ug/m³ Geometric Mean	Geometric Standard Deviation	Percent Reduction Nevada	Percent Reduction Federal	24-Hour Concentration Federal and Nevada AAQS - 150 ug/m³ Number Over Maximum	Concentration Maximum High	Concentration Second High	Percent Reduction Required Federal & Nevada High	Percent Reduction Required Federal & Nevada Second High
GABBS (147) 1974	JAN-MAR	12	106	1.77	43	29	3	278	226	46	34
	APR-JUN	12	70		14	--	0	135	112	--	--
	JUL-SEP	3	25		--	--	0	34	29	--	--
	OCT-DEC	13	169		64	55	8	377	265	96	43
	TOTAL 1974	40	75	2.25	20	--	11	377	278	96	46
GABBS (147) 1973	JAN-MAR	3	59	1.19	--	--	--	71	57	--	--
	APR-JUN	15	144	5.58	59	47	3	198	165	24	9
	JUL-SEP	14	110	1.40	45	31	1	282	136	46	--
	OCT-DEC	15	154	1.95	61	51	10	337	327	55	55
	TOTAL 1973	46	142	3.10	57	47	14	337	327	55	55
GABBS (147) 1972	JAN-MAR	14	140	1.98	70	56	7	446	304	70	55
	APR-JUN	15	98	1.54	52	31	3	239	200	42	29
	JUL-SEP	15	76	1.58	31	2	1	216	131	35	--
	OCT-DEC	12	84	2.28	41	15	4	279	256	51	46
	TOTAL 1972	56	97	1.89	52	31	15	446	304	70	55

Site No.	Sample Period (Number Observations)	Geometric Mean Primary AAQS - 260 ug/m³ Secondary AAQS - 60 ug/m³ Actual	Percent Deviation Primary AAQS	Percent Deviation Secondary AAQS	Geometric Standard Deviation GSD	24-Hour Maximum Primary AAQS - 260 ug/m³ Secondary AAQS - 150 ug/m³ Maximum Observations	Percent Observations Primary AAQS	Percent Observations Secondary AAQS	Percent Emission Reduction Required To Achieve Primary Based On Geometric Mean	Based On Maximum Observations
21	JAN-MAR									
	APR-JUN									
	JUL-SEP (15)	117	56	95	2.10	501	20	27	46	51
	OCT-DEC (6)	58	-23	-3	2.31	209	--	17	-51	-28
	1971 (21)	96	28	60	2.26	501	19	24	30	51

Assumed Background Level - 25 ug/m³

SOURCE: State of Nevada, Environmental Protection Services, Air Quality Control, Carson City, Nevada.

PRELIMINARY DRAFT

APPENDIX D

SOILS

PRELIMINARY
DRAFT

TABLE D- 1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
1	Lithic Xeric Haplargids - 30 to 50% slopes very gravelly (25%)	Upland plains and mountain slopes, and foothills	black sagebrush spiny hopsage, Galleta grass	Well-drained	10 to 20 to bedrock	Moderate
	Lithic Torriorthents - 2 to 50% slopes very stony (20%) Rock Outcrop (20%)	Upland plains and mountain slopes, and foothills	black sagebrush, bud sagebrush, Galleta grass, Indian ricegrass, ephedra, Utah juniper	Well-drained	10 to 20 to bedrock	Moderately Rapid
	Typic Durorthids - 15 to 50% slopes, very cobbly (10%) (25% Inclusions)	Upland plains and mountain slopes, and foothills	Bailey greasewood, shadscale, bud sagebrush, ephedra, Galleta grass, horsebrush, desert needlegrass	Well-drained	20 to pan	Moderately Rapid
2	Haplic Durargids - 2 to 8% slopes, shallow, very gravelly (40%)	Outwash plains, alluvial fans, and lake terraces	Bailey greasewood, shadscale, bud sagebrush, ephedra, Galleta grass, Indian ricegrass	Well-drained	10 to 20 to pan	Slow
	Typic Torriorthents - 0 to 8% slopes, gravelly (10%)	alluvial fans and aprons	Bailey greasewood, shadscale, bud sagebrush ephedra, Galleta grass Indian ricegrass, salt-bush	Well-drained	> 60	Very Rapid
	Typic Durargids - 2 to 8% slopes, shallow, very gravelly (10%) (40% Inclusions)	broad alluvial fans	Bailey greasewood, shadscale, bud sagebrush, ephedra, Galleta grass, Indian ricegrass, salt-bush, winterfat	Well-drained	10 to 20 to pan	Slow to very slow

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
3	Typic Torriorthents - 0 to 4% slopes, (30%)	gently sloping alluvial fans and aprons	shadscale, bud sagebrush Galleta grass, Indian ricegrass	Well-drained	> 60	Moderately Rapid
	Typic camborthids - 0 to 4% slopes, (20%)	gently sloping, alluvial fans and aprons	spiny hop sage, bud sagebrush, fourwing saltbrush, winterfat, Indian ricegrass	Well-drained	> 60	Moderately Rapid
	Duric Camborthids - 0 to 4% slopes, (20%)	gently sloping, alluvial fans and aprons	shadscale, bud sagebrush horsebrush, Indian ricegrass	Well-drained	> 60	Moderately Rapid
	Haplic Nadurargids 0 to 4% slopes, shallow, dissected (15%)	gently sloping, alluvial fans and aprons	shadscale, bud sagebrush horsebrush, Indian ricegrass, winterfat	Well-drained	10 to pan	Moderately Slow over Slow
	Typic Torrifluvents - 0 to 4% slopes, dissected (15%)	modern drainageway floodplains	black greasewood, big sagebrush, shadscale, fourwing saltbush, bud sagebrush	Well-drained	> 60	Moderately Slow
4	Torriorthents - 0 to 8% slopes, gravelly, stony (90%) (10% Inclusions)	nearly level slopes of alluvial fans	shadscale, bud sagebrush Indian ricegrass, black sagebrush, sand dropseed, squirrel tail, Galleta grass, king desertgrass, Bailey greasewood	Somewhat excessive to excessive	> 60	Moderately Rapid to Very Rapid

TABLE D- 1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
5	Duric Haplargids - 0 to 8% slopes, gravelly (60%)	moderately sloping dissected alluvial fans	shadscale, bud sagebrush, Bailey greasewood, Galleta grass, Indian ricegrass	Well-drained	36 to 60	Moderately Slow to Moderately Rapid
	Duric Haplargids - 4 to 30% slopes, very stony (15%)	Moderately sloping dissected alluvial fans	shadscale, bud sagebrush Bailey greasewood, Galleta grass, Indian ricegrass	Well-drained	60	Moderately Slow
	Typic Torriorthents - 0 to 8% slopes, stony, gravelly (10%) (15% Inclusions)	alluvial fans and aprons	Bailey greasewood, shadscale, bud sagebrush Galleta grass, Indian ricegrass, fourwing saltbrush	Excessive	60	Very Rapid
6	Typic Torripsamments - 0 to 30% slopes, (95%) (5% Inclusions)	lake-plain, terraces and stabilized dunes	fourwing saltbush, sand dropseed, Indian ricegrass, black greasewood, horsebrush	Somewhat excessively to excessively	> 60	Rapid to Very Rapid
7	Duric Camborthids - 0 to 2% slopes, gravelly (30%)	valley plains; alluvial fans	Bailey greasewood, wolfberry, shadscale, Indian ricegrass, bud sagebrush, black sagebrush, Galleta grass	Somewhat excessively drained	> 60	Moderately Rapid
	Entic Durorthids - mesic, 0 to 4% slopes, shallow, gravelly (25%)	valley plains; alluvial fans	Bailey greasewood, wolfberry, shadscale, Indian ricegrass, black sagebrush, bud sagebrush, Galleta grass	Well-drained	10 to 20 to pan	Moderately Rapid

TABLE D--1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
7 (cont.)	Typic Camborthids - 0 to 4% slopes (20%) (25% Inclusions)	valley plains; alluvial fans	Bailey greasewood, wolfberry, shadscale, Indian ricegrass, black sagebrush, Galleta grass	Well-drained	60	Moderately Rapid
8	Playas	valley floor playa	barren	Poorly drained	> 60	Very Slow
9	Aquic Torriorthents - 0 to 2% slopes, saline-alkali (40%)	nearly level basins and terraces	saltgrass, black greasewood, alkali sacation	Somewhat poorly drained	> 60	Very Slow
	Aeric Halaquepts - 0 to 2% slopes (30%) (30% Inclusions)	lake terraces, floodplains, toe slope margins of alluvial fans	black greasewood, saltgrass, quailbush, common reedgrass, alkali cordgrass, pickleweed, Great Basin wildrye, alkali sacaton, rabbitbrush	Somewhat poorly drained	> 60	Moderately Slow
10	Aquic Calciorthids - 0 to 2% slopes, saline (20%)	on lake plains in complexes with the Natrargids	black greasewood, rabbitbrush, saltbush, saltgrass, alkali sacaton, shadscale	Poorly drained (Subject to overflow)	> 60	Moderate
	Aquic Natragids - 0 to 2% slopes, saline (20%)	on lake plains in complexes with the Calciorthids	black greasewood, rabbitbrush, saltbush, saltgrass, alkali sacaton, shadscale	Poorly drained (Subject to overflow)	> 60	Slow

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
	Aquic Torriorthents - 0 to 2% slopes (15%)	lake plains marginal to playas	black greasewood	Poorly drained (Subject to overflow)	> 60	Slow
	Typic Torriorthents 4 to 30% slopes (10%)	Large coppice dunes of sand-sized clay aggregates	black greasewood	Well-drained	> 60	Slow
	Typic Nadurargids - 0 to 4% slopes, shallow, saline (10%)	alluvial fan toeslopes, lake plains and weathered travertine spring mounds	black greasewood, shadscale	Well-drained	10 to 20 to hardpan	Slow
	Typic Calciaquolls - 0 to 2% slopes (10%) (15% Inclusions)	seep and overflow areas below springs	native wet meadow	Poorly drained (Subject to overflow)	> 60	Slow
11	Duric Natrargids - 0 to 4% slopes, gravelly substratum (30%)	interfluves of dissected and smooth alluvial fans	shadscale, bud sagebrush, Bailey greasewood, Galleta grass, rabbitbrush	Well-drained	18 to 30 to gravel	Slow
	Duric Natrargids - 0 to 2% slopes (30%)	smooth alluvial fan toeslopes, lacustrine plains, and basin fill plains	shadscale, Bailey greasewood, bud sagebrush, rabbitbrush, Galleta grass	Well-drained	18 to 26 to gravel	Moderate

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
	Duric Natrargids - 4 to 15% slopes gravelly substratum (10%)	smooth and dissected, middle and upper alluvial fans	shadscale, bud sagebrush, Galleta grass, rabbitbrush	Well-drained	18 to 26 to gravel	Moderate
	Haplic Nadurargids - 0 to 2% slopes, shallow (10%) (20% Inclusions)	lake plains	black greasewood, shadscale, bud sagebrush, rabbitbrush	Well-drained	10 to 20 to hardpan	Moderate
12	Duric Camborthids - 0 to 4% slopes (30%)	smooth alluvial fans and fan toeslopes	shadscale, bud sagebrush, Indian ricegrass, Galleta grass	Well-drained	> 40	Moderately Rapid
	Typic Torriorthents - 0 to 8% slopes (30%)	dissected and smooth alluvial fans	spiny hopsage, shadscale, bud sagebrush	Well-drained	7 to 14 to gravel	Moderately Rapid
	Typic Camborthids - 0 to 4% slopes (20%)	smooth, lower alluvial fans and fan toeslopes	shadscale, bud sagebrush, Bailey greasewood, spiny hopsage	Well-drained	12 to 20 to gravel	Moderately Rapid
	(20% Inclusions)					
13	Haplic Durargids - 2 to 8% slopes, shallow (50%)	dissected and smooth alluvial fans (in complexes with the other Argids)	black sagebrush, shadscale, bud sagebrush, Galleta grass	Well-drained	10 to 20 to hardpan	Slow
	Entic Durorthids - 2 to 15% slopes, shallow (15%)	smooth and dissected alluvial fans (in complexes with other Durorthids and Durargids)	rabbitbrush, shadscale, spiny hopsage Galleta grass, Bailey greasewood	Well-drained	10 to 20 to hardpan	Moderate

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
	Duric Camborthids - 2 to 8% slopes (10%) (25% Inclusions)	smooth, small, recent alluvial fans and drainageways	rabbitbrush, shadscale spiny hopsage, Galleta grass, Bailey greasewood	Well-drained	10 to 20 to gravel	Moderate Rapid
14	Rubbleland and Rock outcrop (35%)	mountain slopes, cliffs, crags, summits screes, and rock tablelands	shrubs, Utah juniper, pinyon pine	--------	------	-------
	Typic Durargids - 4 to 30% slopes, shallow, stony (15%)	smoothly rounded volcanic mountains and foothills at lower elevations	black sagebrush, shadscale, squirreltail grass, rabbitbrush	Well-drained	7 to 18 to hardpan	Slow
	Lithic Xerollic Haplargids - 30 to 70% slopes, slightly stony (15%) (35% Inclusions)	sideslopes of broadly rounded large mountain ridges	pinyon juniper, black sagebrush, big sagebrush	Well-drained	7 to 20 to bedrock	Slow
15	Haploxerollic Durargids - 2 to 8% slopes, shallow, very gravelly (40%)	outwash plains and alluvial fans	black sagebrush, big sagebrush, low sagebrush, Indian ricegrass	Well-drained	8	Slow
	Xeric Torriorthents - 0 to 8% slopes, gravelly (10%)	outwash plains and alluvial fans	black sagebrush, big sagebrush, low sagebrush, Indian ricegrass	Well-drained	>60	Rapid
	Xerollic Durargids - 2 to 8% slopes, shallow, gravelly (10%) (40% Inclusions)	outwash plains and alluvial fans	black sagebrush, big sagebrush, low sagebrush, Indian ricegrass	Well-drained	10 to 20 to pan	Slow

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
16	Duric Camborthids - 0 to 10% slopes, gravelly (90%) (10% Inclusions)	smooth alluvial fans and fan toeslopes	upland greasewood, black sagebrush	Well-drained	>60	Moderately Rapid
17	Entic Durothids - 2 to 15% slopes, stony, shallow (50%)	smooth and dissected alluvial fans	black sagebrush, pinyon juniper	Well-drained	10 to 20 to pan	Slow
	Typic Durorthids - 2 to 15% slopes, gravelly, stony (15%)	smooth and dissected alluvial fans	black sagebrush, pinyon juniper	Well-drained	10 to 20 to pan	Slow
	Haplic Durargids - 2 to 8% slopes, gravelly, shallow (15%) (20% Inclusions)	smooth and dissected alluvial fans	black sagebrush, pinyon juniper	Well-drained	10 to 20 to pan	Slow
20	Duric Camborthids - 0 to 2% slopes, overflowed, gravelly (30%)	valley plains	greasewood, shadscale, bud sagebrush	Well-drained (occasionally overflowed)	>60	Moderately Rapid
	Entic Durorthids - 0 to 4% slopes, shallow gravelly, overflowed (25%)	valley plains	greasewood, shadscale, bud sagebrush	Well-drained (occasionally overflowed)	10 to 20 to pan	Slow
	Typic Camborthids - 0 to 4% slopes, overflowed (20%) (25% Inclusions)	valley plains	greasewood, shadscale, bud sagebrush	Well-drained (occasionally overflowed)	> 60	Moderately Rapid

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
21	Typic Torriorthents - 0 to 4% slopes, eroded (30%)	gently sloping alluvial fans and aprons	shadscale, Galleta grass, winterfat	Well-drained	>60	Moderately Rapid
	Typic Camborthids - 0 to 4% slopes, eroded (20%)	gently sloping alluvial fans and aprons	shadscale, Galleta grass, winterfat	Well-drained	> 60	Moderately Rapid
	Duric Camborthids - 0 to 4% slopes, eroded (20%)	gently sloping alluvial fans and aprons	shadscale, Galleta grass, winterfat	Well-drained	> 60	Moderately Rapid
	Haplic Nadurargids - 0 to 4% slopes, eroded, shallow (15%)	gently sloping alluvial fans and aprons	shadscale, Galleta grass, winterfat	Well-drained	10 to 20 to pan	Moderate to Slow
	Typic Torrifluvents - 0 to 4% slopes, eroded (15%)	modern drainageway, floodplains	shadscale, Galleta grass, winterfat	Well-drained	>60	Moderate
22	Xeric Torriorthents - 0 to 4% slopes (30%)	gently sloping alluvial fans and aprons	big sagebrush, black sagebrush, rabbitbrush	Well-drained	>60	Moderately Rapid
	Xerollic Camborthids - 0 to 4% slopes (20%)	gently sloping alluvial fans and aprons	big sagebrush, black sagebrush, rabbitbrush	Well-drained	>60	Moderately Rapid
	Durixerollic Camborthids - 0 to 4% slopes (20%)	gently sloping alluvial fans and aprons	big sagebrush, black sagebrush, rabbitbrush	Well-drained	>60	Moderately Rapid
	Haploxerollic Nadurargids - 0 to 4% slopes, shallow (15%)	gently sloping alluvial fans and aprons	big sagebrush, black sagebrush, rabbitbrush	Well-drained	10 to 20 to pan	Moderate
	Xeric Torrifluvents - 0 to 4% slopes (15%)	modern drainageway floodplains	big sagebrush, black sagebrush, rabbitbrush	Well-drained	> 60	Moderate

TABLE D- 1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
23	Durixerollic Camborthids - 4 to 8% slopes (30%)	moderately sloping alluvial fans	black sagebrush, big sagebrush	Well-drained	> 60	Moderately Rapid
	Xerollic Durorthids - 4 to 8% slopes, shallow (25%)	moderately sloping alluvial fans	black sagebrush, big sagebrush	Well-drained	10 to 20 to pan	Moderate
	Xerollic Camborthids - 4 to 8% slopes (20%) (25% Inclusions)	moderately sloping alluvial fans	black sagebrush, big sagebrush	Well-drained	> 60	Moderate
24	Durixerollic Camborthids - 0 to2% slopes (30%)	moderately sloping alluvial fans	black sagebrush	Well-drained	> 60	Moderately Rapid
	Xerollic Durorthids - 0 to 4% slopes, shallow (25%)	moderately sloping alluvial fans	black sagebrush	Well-drained	10 to 20 to pan	Moderate
	Xerollic Camborthids - 0 to 4% slopes (20%) (25% Inclusions)	moderately sloping alluvial fans	black sagebrush	Well-drained	> 60	Moderate
25	Durixerollic Natrargids - 0 to 2% slopes, saline, eroded (70%)	smooth alluvial fans or basin-fill plains	rabbitbrush, shadscale, Bailey greasewood	Well-drained	> 60	Moderate
	Xerollic Natrargids - 0 to 2% slopes, saline, eroded (15%)	smooth alluvial fan footslopes	rabbitbrush, shadscale, Bailey greasewood	Well-drained	> 60	Moderate
	Xeric Torriorthents - 0 to 2% slopes, saline-alkali, eroded (10%) (5% inclusions)	basin-fill plains	rabbitbrush, shadscale, Bailey greasewood	Well-drained	> 60	Moderate

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
26	Haploxerollic Durargids - 2 to 8% slopes, very gravelly, shallow, dissected (40%)	outwash plains and alluvial fans	black sagebrush, big sagebrush, low sagebrush, Galleta grass, pinyon pine, Utah juniper	Well-drained	8	Slow
	Xeric Torriorthents - 0 to 8% slopes, gravelly, dissected (10%)	outwash plains and alluvial fans	black sagebrush, big sagebrush, low sagebrush, Galleta grass, pinyon pine, Utah juniper	Well-drained	> 60	Rapid
	Xerollic Durargids - 2 to 8% slopes, shallow, very gravelly (10%) (40% Inclusions)	outwash plains and alluvial plains	black sagebrush, big sagebrush, low sagebrush, Galleta grass, pinyon pine, Utah juniper	Well-drained	10 to 20 to pan	Moderately Rapid
28	Haplic Durargids - 2 to 8% slopes, shallow, very gravelly, dissected (40%)	outwash plains and alluvial fans	black sagebrush, shadscale, saltbush, winterfat, halogeton	Well-drained	8	Slow
	Typic Torriorthents - 0 to 8% slopes, gravelly, dissected (10%)	outwash plains and alluvial fans	black sagebrush, shadscale, saltbush, winterfat, halogeton	Well-drained	> 60	Rapid
	Typic Durargids - mesic, very gravelly, dissected (10%) (40% Inclusions)	outwash plains and alluvial fans	black sagebrush, shadscale, saltbush, winterfat, halogeton	Well-drained	10 to 20 to pan	Moderately Rapid

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
29	Torriorthents - 0 to 10% slopes, gravelly (40%)	alluvial fans and toeslopes of alluvial fans	shadscale, winterfat	Well-drained	> 60	Moderately Rapid
	Duric Haplargids - 0 to 10% slopes gravelly (35%)	alluvial fans and toeslopes of alluvial fans	shadscale, bud sagebrush, winterfat, Galleta grass, Indian ricegrass	Well-drained	> 60	Moderate
	Duric Camborthids - 0 to 10% slopes, gravelly (20%) (5% inclusions)	alluvial fans and toeslopes of alluvial fans	shadscale, bud sagebrush, winterfat, Galleta grass, Indian ricegrass	Well-drained	> 60	Moderately Rapid
30	Duric Camborthids - 11 to 25% slopes, very gravelly (35%)	sloping and moderately steep, alluvial fans and pediment remnants	big sagebrush, greasewood	Well-drained	> 60	Moderately Rapid
	Duric Camborthids - 11 to 25% slopes, stony (35%)	sloping and moderately steep, alluvial fans and pediment remnants	big sagebrush, greasewood	Well-drained	> 60	Rapid
	Torriorthents - 11 to 25% slopes, gravelly (20%)	sloping and moderately steep, alluvial fans and pediment remnants	big sagebrush, greasewood	Well-drained	> 60	Moderately Rapid
	Durorthids - 11 to 25% slopes, shallow (10%)	sloping and moderately steep, alluvial fans and pediment remnants	big sagebrush, greasewood	Well-drained	10 to 20 to pan	Moderately Rapid

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
31	Aquic Calciorthids - 0 to 2% slopes, saline, eroded (20%)	on lake plains in complexes with the Natrargids	black greasewood, rabbitbrush, saltbrush, saltgrass, alkali sacaton, shadscale	Poorly drained (Subject to overflow)	>60	Slow
	Aquic Natragids - 0 to 2% slopes, saline, eroded (20%)	on lake plains in complexes with the Calciorthids	black greasewood, rabbitbrush, saltbush, saltgrass, alkali sacaton, shadscale	Poorly drained (Subject to overflow)	>60	Slow
	Aquic Torriorthents - 0 to 2% slopes, eroded (15%)	lake plains marginal to playas	black greasewood	Poorly drained (Subject to overflow)	>60	Slow
	Typic Torriorthents - 4 to 30% slopes, eroded (10%)	large coppice dunes of sandsized clay aggregates	black greasewood	Well-drained	>60	Slow
	Typic Nadurargids - 0 to 4% slopes, shallow, saline, eroded (10%)	alluvial fan toeslopes, lake plains and weathered travertine spring mounds	black greasewood, shadscale	Well-drained	10 to 20 to hardpan	Slow
	Typic Calciaquolls - 0 to 2% slopes, eroded (10%) (Inclusions 15%)	seep and overflow areas below springs	native wet meadow	Poorly drained (Subject to overflow)	>60	Slow
32	Typic Torriorthents - 0 to 4% slopes, dissected (30%)	gently sloping alluvial fans and aprons	shadscale, bud sagebrush, Galleta grass	Well-drained	>60	Moderately Rapid

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TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
	Typic Camborthids - 0 to 4% slopes, dissected (20%)	gently sloping alluvial fans and aprons	shadscale, bud sagebrush, Galleta grass	Well-drained	> 60	Moderately Rapid
	Duric Camborthids - 0 to 4% slopes, dissected (20%)	gently sloping alluvial fans and aprons	shadscale, bud sagebrush, Galleta grass	Well-drained	> 60	Moderately Rapid
	Haplic Nadurargids - 0 to 4% slopes, shallow, dissected (15%)	gently sloping alluvial fans and aprons	shadscale, bud sagebrush, Galleta grass	Well-drained	10 to 20 to pan	Moderate
	Typic Torrifluvents - 0 to 4% slopes, dissected (15%)	modern drainageway, floodplains	shadscale, bud sagebrush, Galleta grass	Well-drained	> 60	Moderate
34	Xerollic Durorthids - 15 to 30% slopes, dissected (40%)	dissected pediment sideslopes and ridges	pinyon pine, Utah juniper, ephedra	Well-drained	30 to 40 to pan	Moderate
	Xerollic Paleargids - 15 to 30% slopes (20%)	dissected remnants of alluvial fans and pediments	pinyon pine, black sagebrush, squirreltail, Galleta grass	Well-drained	30 to 40 to pan	Moderately Rapid
	Typic Durorthids - 15 to 30% slopes, dissected (20%)	deeply dissected pediment sideslopes	Utah juniper, big sagebrush	Well-drained	30 to 40 to pan	Moderately Rapid
	Haploxerollic Durorthids - 15 to 30% slopes (10%)	deeply dissected pediment sideslopes	Utah juniper, big sagebrush, Indian ricegrass	Well-drained	20 to 30 to pan	Moderate
	Typic Torripsamments - 4 to 15% slopes, dissected (10%)	deeply dissected, broad pediment ridge	pinyon pine, big sagebrush	Well to somewhat excessive	> 60	Rapid

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
35	Typic Camborthids - 0 to 10% slopes (30%)	stream terraces	big sagebrush, spiny hopsage, Indian ricegrass, Russian thistle	Well-drained	>40	Moderate
	Xerollic Camborthids - 0 to 10% slopes (30%)	stream terraces, valley bottoms, relict floodplains	big sagebrush, rabbitbrush, Indian ricegrass	Well-drained	>40	Moderate
	Xeric Torrifluvents - 0 to 10% slopes (30%) (10% Inclusions)	relict floodplains	big sagebrush, spiny hopsage, Indian ricegrass, winterfat, shadscale	Well-drained	>40	Moderate
36	Typic Camborthids - 0 to 10% slopes (50%)	alluvial fan	big sagebrush, rabbitbrush, Galleta grass, winterfat, shadscale	Well-drained	>40	Moderately Rapid
	Typic Durargids - 0 to 10% slopes (30%)	alluvial fan	rabbitbrush, bud sagebrush, sand dropseed	Well-drained	20 to 30 to pan	Slow
	Xerollic Haplargids - 0 to 10% slopes (15%) (5% Inclusions)	alluvial fan	big sagebrush, Galleta grass, shadscale, rabbitbrush	Well-drained	>40	Moderately Rapid
37	Torriorthents - 0 to 8% slopes, gravelly, stony	nearly level slopes of alluvial fans	low sagebrush, shadscale	Excessive	> 60	Rapid

TABLE D- 1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
40	Aridic Haploxerolls - 15 to 50% slopes, stony (30%)	mountain sideslopes, shoulders and crests	pinyon pine, big sagebrush, black sagebrush	Well-drained	> 40	Moderate
	Aridic Argixerolls - 8 to 50% slopes, stony (30%)	mountain sideslopes, shoulders and crests	black sagebrush, mountain mahogany, snowberry, big sagebrush, pinyon pine, Utah juniper, bitterbrush	Well-drained	> 40	Moderately Slow
	Lithic Xerollic Haplargids - 30 to 70% slopes, stony (15%)	mountain sideslopes, shoulders and crests	low sagebrush, black sagebrush, big sagebrush, pinyon pine	Well-drained	10 to 20 to bedrock	Moderate
	Lithic Camborthids - 4 to 30% slopes, gravelly (15%) (10% Inclusions)	dissected, moderately steep, mountain lands and pediment sideslopes	pinyon pine, Utah juniper, black sagebrush, bitterbrush, big sagebrush	Well-drained	10 to 20 to bedrock	Moderate
41	Xerollic Paleargids - 4 to 15% slopes, gravelly, stony (35%)	pediment footslopes, alluvial fan remnants	black sagebrush, shadscale, big sagebrush, rabbitbrush, Galleta grass	Well-drained	> 40	Slow
	Xerollic Durargids - 2 to 8% slopes, gravelly and stony (45%) (20% Inclusions)	smooth and dissected alluvial fans	black sagebrush, big sagebrush, Galleta grass	Well-drained	20 to 30 to pan	Slow
44	Lithic Xerollic Haplargids - 15 to 50% slopes (40%)	mountain slopes, foothills and pediments	black sagebrush, bluegrass, Indian ricegrass, needlegrass	Well-drained	10 to 20 to bedrock	Moderately Slow

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PRELIMINARY DRAFT

TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
44	Lithic Torriorthents - 8 to 50% slopes (20%) Rock outcrop (20%) (20% Inclusions)	mountain slopes, foothills and pediments	black sagebrush, ephedra, Indian ricegrass, Galleta grass, bud sagebrush, shadscale	Well-drained	10 to 20 to bedrock	Moderate
48	Lithic Haplargids - 8 to 50% slopes, stony (35%)	mountain slopes and rolling hills	shadscale, menodora, fourwing saltbush, ephedra, Indian ricegrass, Galleta grass	Well-drained	10 to 20 to bedrock	Moderately Slow
	Lithic Haplargids - 4 to 15% slopes, stony (25%)	rolling foothills	shadscale, kochia, menodora, ephedra	Well-drained	10 to 20 to bedrock	Moderately Slow
	Lithic Xerollic Haplargids - 4 to 30% slopes, stony (15%) (25% Inclusions)	mountain slopes and rolling hills	black sagebrush, rabbitbrush, spiny hopsage, yucca, Galleta grass, pinyon pine, juniper	Well-drained	10 to 20 to bedrock	Moderately Slow
49	Duric Haplargids - 0 to 8% slopes, gravel substratum, stony (75%) (25% Inclusions)	alluvial fans	upland greasewood, shadscale, wolfberry, ephedra, Galleta grass, dalea	Well-drained	> 60	Moderately Slow
56	Lithic Haplargids - 4 to 30% slopes, stony (40%) Roc outcrop (30%)	mountain slopes and rolling hills	shadscale, menodora, fourwing saltbush, ephedra, Indian ricegrass, Galleta grass	Well-drained	10 to 20 to bedrock	Moderately Slow
	Lithic Haplargids - 4 to 30% slopes (20%) (10% Inclusions)	mountain slopes and rolling hills	shadscale, menodora, rabbitbrush, ephedra, Indian ricegrass, desert needlegrass, buckwheat	Well-drained	10 to 20 to bedrock	Slow

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PRELIMINARY DRAFT

TABLE D- 1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
58	Typic Durargids - 0 to 4% slopes, shallow (50%)	alluvial fans	shadscale, ephedra, rabbitbrush, bud sagebrush, winterfat	Well-drained	10 to 20 to hardpan	Moderately Slow
	Duric Haplargids - 4 to 15% slopes, gravel substratum, dissected (30%) (20% Inclusions)	alluvial fans	upland greasewood, shadscale, ephedra, Galleta grass, bud sagebrush	Well-drained	> 60	Moderately Slow
59	Typic Torriorthents - 2 to 8% slopes (40%)	alluvial fans	shadscale, upland greasewood, wolfberry, Indian ricegrass	Somewhat excessive	> 60	Rapid
	Typic Torripsamments - 2 to 8% slopes (20%)	alluvial fans	shadscale, upland greasewood, wolfberry, Indian ricegrass	Excessive	> 60	Very Rapid
	Duric Haplargids - 4 to 15% slopes, stony (20%) (20% Inclusions)	alluvial fans	shadscale, upland greasewood, ephedra, Galleta grass, bud sagebrush	Well-drained	> 60	Moderately Slow
60	Rock outcrop - (50%)	-----	-----	-----	-----	------
	Lithic Torripsamments - 30 to 50% slopes (20%)	mountain slopes	black sagebrush, juniper, shadscale squirreltail, rabbitbrush	Excessive	10 to 20 to bedrock	Very Rapid
	Xeric Torripsamments - 30 to 50% slopes, shallow (20%) (10% Inclusions)	mountain slopes	black sagebrush, juniper, squirreltail, rabbitbrush, Indian ricegrass	Excessive	10 to 20 to paralithic contact	Very Rapid

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TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
62	Lithic Haplargids - 4 to 15% slopes, (40%)	rolling hills	shadscale, ephedra, upland greasewood, bud sagebrush, Indian ricegrass, Galleta grass	Well-drained	10 to 20 to bedrock	Moderately Slow
	Rock outcrop - (30%)					
	Typic Haplargids - 4 to 15% slopes, stony (20%) (10% Inclusions)	alluvial fans	shadscale, ephedra, upland greasewood, bud sagebrush, Indian ricegrass	Well-drained	> 60	Moderately Slow
63	Typic Torriorthents - 0 to 2% slopes, flooded, saline (50%)	floodplains, and basins	black greasewood, kochia, shadscale, saltgrass	Moderately well	> 60	Moderately Rapid
	Typic Torriorthents - 0 to 4% slopes (30%) (20% Inclusions)	alluvial fans	wolfberry, upland greasewood, kochia, shadscale, Indian ricegrass	Somewhat excessive	> 60	Rapid
64	Haplic Durargids - 2 to 8% slopes, very stony (40%)	alluvial fans	upland greasewood, shadscale, bud sagebrush, ephedra, Galleta grass, Indian ricegrass	Well-drained	10 to 20 to pan	Moderately Slow
	Typic Torriorthents - 2 to 8% slopes, stony (30%)	alluvial fans	upland greasewood, shadscale, bud sagebrush, fourwing saltbush, Indian ricegrass	Somewhat excessive	> 60	Rapid
	Typic Durargids - 2 to 8% slopes, shallow, stony (15%) (15% Inclusions)	alluvial fans	upland greasewood, shadscale, bud sagebrush, Galleta grass, Indian ricegrass	Well-drained	10 to 20 to pan	Moderately Slow

TABLE D- 1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
66	Duric Camborthids - 0 to 2% slopes (40%)	basins, low terraces and alluvial fans	upland greasewood, shadscale, bud sagebrush, wolfberry, kochia, Indian ricegrass	Well-drained	>60	Moderately Rapid
	Typic Camborthids - 0 to 2% slopes, saline (30%)	alluvial fans	upland greasewood, shadscale, bud sagebrush, Indian ricegrass, Galleta grass	Well-drained	>60	Moderately Rapid
	Entic Durorthids - 0 to 2% slopes, shallow, saline (20%) (10% Inclusions)	basins and low terraces	upland greasewood, shadscale, wolfberry, bud sagebrush, kochia	Well-drained	10 to 20 to pan	Moderately Rapid
67	Typic Torriorthents - 2 to 8% slopes, cobbly (40%)	alluvial fans	upland greasewood, wolfberry, kochia, shadscale (very low density)	Well-drained	60	Moderately Rapid
	Typic Natrargids - 2 to 8% slopes, cobbly, shallow (20%)	alluvial fans	shadscale, bud sagebrush, ephedra, upland greasewood, Galleta grass (very low density)	Well-drained	10 to 20 to paralithic contact	Moderately Slow
	Duric Haplargids - 2 to 8% slopes, very stony (20%) (20% Inclusions)	alluvial fans	upland greasewood, shadscale, ephedra, Galleta grass, bud sagebrush (very low density)	Well-drained	60	Moderately Slow
68	Rock outcrop - (40%)					
	Lithic Xerollic Haplargids - 15 to 50% slopes (30%)	mountain and hill slopes	black sagebrush, ephedra, bluegrass, Indian ricegrass, spiny hopsage, needlegrass, horsebrush	Well-drained	10 to 20 to bedrock	Moderately Slow

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TABLE D-1
KINDS OF SOILS IN MAP UNITS AND THEIR PROPERTIES
TONOPAH GRAZING ES STUDY AREA

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit and Approximate Proportions	Physiographic Position	Typical Vegetation	Soil Drainage Class	Depth to Bedrock or Hardpan (inches)	Profile Permeability
	Lithic Torriorthents - 15 to 50% slopes (20%) (10% Inclusions)	mountain and hill slopes	black sagebrush, ephedra, shadscale, Indian ricegrass, Galleta grass, horsebrush	Well-drained	10 to 20 to bedrock	Moderately Rapid
72	Lithic Haplargids - 15 to 50% slopes (50%) Rock outcrop (40%) (10% Inclusions)	mountain slopes and rolling hills	shadscale, rabbitbrush, menodora, ephedra, Indian ricegrass, desert needlegrass, buckwheat	Well-drained	10 to 20 to bedrock	Slow

Abbreviations used in this table:

PRELIMINARY DRAFT

TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydrologic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
1	Lithic Xeric Haplargids - 30 to 50% slope, very gravelly (25%)	D	Moderate	Slight	GM-GC or G-C	Very low	Very poor: steep slopes; droughtiness	Rapid	8 to 12
	Lithic Torriorthents - 2 to 50% slopes, very stony (20%)	D	Moderate	Slight	GM	Very low	Very poor: droughtiness; steep slopes	Very Rapid	6 to 10
	Rock Outcrop (20%)								
	Typic Durorthids - 15 to 50% slopes, very cobbly (10%)	D	Slight	Slight	SM or SM-SC	Very low	Very poor: steep slopes; droughtiness; >50% surface cobbles	Medium	6 to 8
	Inclusions (25%)								
2	Haplic Durargids - 2 to 8% slopes, very gravelly (40%)	D	Moderate	Slight	SM or GC over GP, GM or GW	Very low	Very poor: droughtiness; very low AWHC	Medium to Rapid	4 to 7
	Typic Torriorthents - 0 to 8% slopes, gravelly (10%)	B	Moderate	Slight	GP-GM over GP or GP-GM	Very low	Very poor: droughtiness, very low AWHC	Very slow to medium	4 to 7
	Typic Durargids - 2 to 8% slopes, shallow, very gravelly (10%)	D	Moderate	Slight	SM over GM-GC or GC	Very low	Very poor: droughtiness, very low AWHC	Rapid	4 to 7
	Inclusions (40%)								
3	Typic Torriorthents - 0 to 4% slopes, (30%)	B	Moderately low	Severe	SM	Moderate to high	Very poor: AAP <8 in.	Slow to medium	4 to 7
	Typic Camborthids - 0 to 4% slopes, (20%)	B	Slight to moderate	Slight	SM	Moderate	Very poor: AAP <8 in.	Medium	4 to 7
	Duric Camborthids - 0 to 4% slopes, (20%)	B	Slight	Moderate	SM	Moderate	Very poor: AAP <8 in.	Slow to medium	4 to 7

PRELIMINARY DRAFT

TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydrologic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
	Haplic Nadurargids - 0 to 4% slopes, shallow, dissected (15%)	D	Slight	Slight	ML or SM	Very low	Very poor: shallow to indurated pan; AAP <8 in.; dissected	Very slow	4 to 7
	Typic Torrifluvents - 0 to 4% slopes, dissected (15%)	B	Slight	Slight	CL	High	Very poor: AAP <8 in., dissected	Slow	4 to 7
4	Torriorthents - 0 to 8% slopes, gravelly stony (90%)	B	Slight to Moderate	Slight to Moderate	GP, GM, SM	Low	Very poor: droughtiness, low AWHC, AAP <8 in.	Very slow to medium	4 to 7
	Inclusions (10%)								
5	Duric Haplargids - 0 to 8% slopes, gravelly (60%)	C	Slight to Moderate	Slight	GC over GP, SM over SC and SM	Low to Moderate	Very poor: droughtiness, low AWHC, AAP <8 in.	Medium to rapid	4 to 7
	Duric Haplargids - 4 to 30% slopes, very stony (15%)	C	Slight	Slight	GC over GP-GM	Low	Very poor: droughtiness, low AWHC, AAP <8 in.	Medium	4 to 7
	Typic Torriorthents - 0 to 8% slopes, stony, gravelly (10%)	B	Slight	Slight	GP or GM	Low	Very poor: droughtiness, low AWHC, AAP <8 in.	Very slow to medium	4 to 7
	Inclusions (15%)								
6	Typic Torripsamments - 0 to 30% slopes (95%)	A	High	Severe	SM	Low to Moderate	Very poor: droughtiness, slope gradient low AWHC	Very slow	4 to 7
	Inclusions (25%)								
7	Duric Camborthids - 0 to 2% slopes, gravelly (30%)	C	Low	Moderate	SM over SP-SM	Low	Very poor: droughtiness, AWHC	Slow	4 to 7
	Entic Durorthids - 0 to 4% slopes, shallow, gravelly (25%)	D	Low	Slight	SM,ML	Very low	Very poor: droughtiness, AHWC	Slow	4 to 7

PRELIMINARY DRAFT

PRELIMINARY DRAFT

TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydrologic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
	Typic Camborthids - 0 to 4% slopes (20%)	B	Low	Severe	SM,ML	Moderate	Very poor: AAP < 8 in.	Slow	4 to 7
	Inclusions (25%)								
8	Playas	D	Low	Slight	CH or CL	High	Very poor: ESP > 15%, d/ AAP < 8 in.	Ponded	4 to 7
9	Aquic Torriorthents - 0 to 2% slopes, saline alkali (40%)	D	Slight	Slight	CL,CH	High	Very poor: ESP > 15% AAP < 8 in.	Very slow to ponded	4 to 7
	Aeric Halaquepts - 0 to 2% slopes (30%)	C	Slight	Slight	ML,Cl	High	Very poor: ESP 15% AAP 8 in., E.C. x 10^3 > 4	Very slow to ponded	4 to 7
	Inclusions (30%)								
10	Aquic Calciorthids - 0 to 2% slopes, saline (20%)	C	Low	Moderate	ML or CL	High	Very poor: E.C. x 10^3 e/ > 4 AAP < 8 in.	Very slow	4 to 7
	Aquic Natragids - 0 to 2% slopes, saline (20%)	D	Low	Slight	CH	High	Very poor: E.C. x 10^3 > 4 AAP < 8 in.	Very slow	4 to 7
	Aquic Torriorthents - 0 to 2% slopes (15%)	D	Low	Slight	CL or CH	High	Very poor: < 8 inches AAP	Slow	4 to 7
	Typic Torriorthents - 4 to 30% slopes (10%)	D	Moderately High	Slight	CL or CH	High	Very poor: < 8 inches AAP	Slow	4 to 7
	Typic Nadurargids - 0 to 4% slopes, shallow, saline (10%)	D	Moderately Low	Slight	ML-CL	Low	Very poor: shallow depth to indurated pan, < 8 in. AAP; E.C. x 10^3 > 4	Slow	4 to 7
	Typic Calciaquolls - 0 to 25% slopes (10%)	D	Low	Slight	ML or CL	High	Very poor: < 8 inches AAP	Slow	4 to 7
	Inclusions (15%)								

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PRELIMINARY DRAFT

TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydro-logic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
11	Duric Natrargids - 0 to 4% slopes gravelly substratum (30%)	D	Moderately low	Moderate	CH or CL over GM	Moderate	Very poor: ESP 5-15% <8 inches AAP	Slow	4 to 7
	Duric Natrargids - 0 to 2% slopes (30%)	C	Low	Moderate	ML or CL over SP or GP	Moderate	Very poor: ESP 5-15% <8 inches AAP	Slow	4 to 7
	Duric Natrargids - 4 to 15% slopes (10%)	C	Moderate	Moderate	ML or CL over SP or GP	Moderate	Very poor: ESP 5-15% <8 inches AAP	Medium	4 to 7
	Haplic Nadurargids - 0 to 2% slopes, shallow (10%)	D	Low	Moderate	CL above hardpan, GP below hardpan	Very low	Very poor: shallow to indurated pan; AAP 8 in.	Slow	4 to 7
	Inclusions (20%)								
12	Duric Camborthids - 0 to 4% slopes (30%)	B	Moderately low	Moderate	SM	Low to moderate	Very poor: low AWHC AAP < 8 in.	Medium	4 to 7
	Typic Torriorthents - 0 to 8% slopes (30%)	B	Moderate	Slight	GM	Low to moderate	Very poor: low AWHC AAP < 8 in.	Medium	4 to 7
	Typic Camborthids - 0 to 4% slopes (20%)	B	Moderately low	Moderate	GM	Low to moderate	Very poor: low AWHC AAP < 8 in.	Medium	4 to 7
	(20% Inclusions)								
13	Haplic Durargids - 2 to 8% slopes, shallow (50%)	D	Moderately low	Slight	CH or CL to hardpan	Very low	Very poor: shallow depth to indurated pan; AAP <8 in.	Medium	4 to 7
	Entic Durorthids - 2 to 8% slopes, shallow (15%)	D	Moderately low	Slight	SM or ML to hardpan	Very low	Very poor: shallow depth to indurated pan; AAP <8 in.	Medium	4 to 7
	Duric Camborthids - 2 to 8% slopes (10%)	B	Moderately low	Slight	GM	Low	Very poor: low AWHC; AAP < 8 in.	Medium	4 to 7

PRELIMINARY DRAFT

TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Lang Types in Map Unit & Approximate Proportions	Soil Hydro-logic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
	Inclusions (25%)								
14	Rubbleland and Rock Outcrop (35%)	D	Low	Slight		Very low	Very poor: droughty, content of rock outcrop and surface stones > 90%	Rapid to Very rapid	8 to 12
	Typic Durargids - 4 to 30% slopes, shallow, stony (15%)	D	Moderately High	Slight	CH	Very low	Very poor: very low AWHC shallow to indurated pan	Medium to rapid	8 to 12
	Lithic Xerollic Haplargids - 30 to 70% slopes, slightly stony (15%)	D	Moderate	Slight	CL or CH	Very low	Very poor: slope > 30% shallow to bedrock, very low AWHC	Rapid	8 to 12
	Inclusions (35%)								
15	Haploxerollic Durargids - 2 to 8% slopes, shallow, very gravelly (40%)	D	Slight	Slight	SM or GC over GP, GM or GW	Very low	Very poor: shallow to indurated pan, very low AWHC	Medium	8 to 15
	Xeric Torriorthents - 0 to 8% slopes, gravelly (10%)	B	Slight	Slight	GP-GM over GP or GP-GM	Very low	Very poor: low AWHC	Slow	8 to 15
	Xerollic Durargids - 2 to 8% slopes, shallow, gravelly (10%)	D	Moderate	Slight	SM over GM-GC or GC	Very low	Very poor: shallow to indurated pan; very low AWHC	Slow to Medium	8 to 15
	Inclusions (40%)								
16	Duric Camborthids - 0 to 10% slopes, gravelly (90%)	B	Moderately low	Moderate	SM	Low to moderate	Very poor: AAP < 8 in.	Medium	4 to 7
	Inclusions (10%)								
17	Entic Durothids - 2 to 15% slopes, stony, shallow (50%)	D	Moderately low	Slight	SM or ML to hardpan	Very low	Very poor: shallow to indurated pan; AAP < 8 in.	Medium	4 to 7

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PRELIMINARY DRAFT

TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydrologic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
	Typic Durorthids - 2 to 15% slopes, gravelly, shallow, stony (15%)	D	Moderate	Slight	SM or ML to hardpan	Very low	Very poor: shallow to indurated pan, AAP < 8 in.	Medium	4 to 7
	Haplic Durargids - 2 to 15% slopes, gravelly shallow (15%)	D	Moderately low	Slight	CH or CL to hardpan	Low to very low	Unsuited	Medium	4 to 7
	Inclusions (20%)								
20	Duric Camborthids - 0 to 2% slopes, gravelly, overflowed (30%)	C	Moderately low	Slight	SM or GP	Low	Very poor: low AWHC; AAP < 8 in.	Slow	4 to 7
	Entic Durorthids - 0 to 4% slopes, shallow, gravelly, overflowed (25%)	D	Moderately low	Slight	SM or ML to pan	Very low	Very poor: very low AWHC; shallow to pan; AAP < 8 in.	Slow	4 to 7
	Typic Camborthids - 0 to 4% slopes, overflowed (20%)	B	Moderately low	Moderate	SM	Low	Very poor: low AWHC, AAP < 8 in.	Slow to medium	4 to 7
	Inclusions (25%)								
21	Typic Torriorthents - 0 to 4% slopes, eroded (30%)	C	High	Severe	SM	Moderate	Very poor: AAP < 8 in.	Slow to medium	4 to 7
	Typic camborthids - 0 to 4% slopes, eroded (20%)	B	High	Severe	SM	Low	Very poor: AAP < 8 in. Low AWHC	Slow to medium	4 to 7
	Duric Camborthids - 0 to 4% slopes, eroded (20%)	B	High	Severe	SM	Low	Very poor: AAP < 8 in. low AWHC	Slow to medium	4 to 7
	Haplic Nadurargids - 0 to 4% slopes, eroded, shallow (15%)	D	High	Severe	ML	Low	Very poor: shallow to indurated pan, AAP < 8 in.; severe erosion	Slow to medium	4 to 7
	Typic Torrifluvents - 0 to 4% slopes, eroded (15%)	B	High	Severe	CL	High	Very poor: AAP < 8 in. severe erosion	Slow to medium	4 to 7

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TABLE D--2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydrologic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
22	Xeric Torriorthents - 0 to 4% slopes (30%)	C	Slight to high	Slight	SM	Moderate to high	Fair: AAP <12 in.	Slow to medium	8 to 11
	Xerollic Camborthids - 0 to 4% slopes (20%)	B	Slight to moderate	Slight	SM	Moderate	Fair: AAP <12 in.	Slow to medium	8 to 11
	Durixerollic Camborthids - 0 to 4% slopes (20%)	B	Slight	Moderate	SM	Moderate	Fair: AAP <12 in.	Slow to medium	8 to 11
	Haploxerollic Nadurargids - 0 to 4% slopes, shallow (15%)	D	Slight	Slight	ML over SM over CL	Very low	Very poor: shallow to indurated pan; very low AWHC	Slow to medium	8 to 11
	Xeric Torrifluvents - 0 to 4% slopes (15%)	B	Slight	Slight	CL	High	Fair: high AWHC; AAP <12 in.	Slow to medium	8 to 11
23	Durixerollic Camborthids - 4 to 8% slopes (30%)	C	Moderate	Slight	SM or GP	Low	Poor: low AWHC	Medium	8 to 11
	Xerollic Durorthids - 4 to 8% slopes, shallow (25%)	D	Moderately low	Slight	SM or ML to pan	Very low	Very poor: shallow to pan; very low AWHC	Medium	8 to 11
	Xerollic Camborthids - 4 to 8% slopes (20%)	B	Moderate	Slight	SM	Moderate	Fair: AAP <12 in., moderate AWHC	Medium	8 to 11
	Inclusions (25%)								
24	Durixerollic Camborthids - 0 to 2% slopes (30%)	C	Slight	Slight	SM or GP	Low	Poor: low AWHC	Medium	8 to 15
	Xerollic Durorthids - 0 to 4% slopes (25%)	D	Slight to moderate	Slight	SM or ML to pan	Very low	Very poor: shallow to pan; very low AWHC	Medium	8 to 15
	Xerollic Camborthids - 0 to 4% slopes (20%)	B	Slight to moderate	Slight	SM	Moderate	Fair: AAP <12 in., moderate AWHC	Medium	8 to 15
	Inclusions (25%)								

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TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydrologic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
25	Durixerollic Natrargids - 0 2% slopes, saline, eroded (70%)	C	High	Moderate	ML or CL	High	Very poor: E.C.x10^3 >4, severe erosion, ESP 5-15%	Slow	8 to 11
	Xerollic Natrargids - 0 to 2% slopes, saline, eroded (15%)	C	High	Moderate	SC over SM	High	Very poor: E.C.x10^3 >4, severe erosion	Slow	8 to 11
	Xeric Torriorthents - 0 to 2% slopes, saline-alkali, eroded (10%)	C	High	Severe	SM	Moderate	Very poor: E.C.x10^3 >4, severe erosion, ESP 5-15%	Slow	8 to 11
	Inclusions (5%)								
26	Haploxerollic Durargids - 2 to 8% slopes, very gravelly shallow, dissected (40%)	D	Slight	Slight	SM	Very low	Very poor: shallow to pan, very low AWHC, >50% surface gravels	Medium to rapid	8 to 15
	Xeric Torriorthents - 0 to 8% slopes, gravelly, dissected, (10%)	B	Slight	Slight	GP or GM	Very low	Very poor: very low AWHC; dissected	Very slow to medium	8 to 15
	Xerollic Durargids - 0 to 8% slopes, shallow, dissected, very gravelly (10%)	D	Slight	Slight	SM	Very low	Very poor: very low AWHC; dissected	Medium to rapid	8 to 15
	Inclusions (40%)								
28	Haplic Durargids - 2 to 8% slopes, shallow, dissected, very gravelly (40%)	D	Slight	Slight	SM	Very low	Very poor: shallow to indurated pan; AAP <8 in.; very low AWHC	Medium to rapid	4 to 7
	Typic Torriorthents - 0 to 8% slopes, gravelly, dissected, (10%)	B	Slight	Slight	GP or GM	Very low	Very poor: very low AWHC, AAP <8 in.	Very slow to medium	4 to 7
	Typic Durargids - 2 - 8% slopes, shallow, dissected very gravelly (10%)	D	Slight	Slight	SM	Very low	Very poor: shallow to pan, very low AWHC, AAP <8 in.	Medium to rapid	4 to 7

PRELIMINARY DRAFT

TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

PRELIMINARY DRAFT

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydro-logic Group	Erosion Hazard Water	Erosion Hazard Wind	Unified Class	Available Water-Holding Capacity (AWHC)	Suitability for Rangeland Seeding	Runoff	Average Annual Precipitation (inches) (AAP)
	Inclusions (40%)								
29	Torriorthents - 0 to 10% slopes, gravelly (40%)	B	Slight to high	Severe	SM	Moderate to high	Very poor: AAP < 8 in.	Slow to medium	4 to 7
	Duric haplargids - 0 to 10% slopes, gravelly (35%)	B	Moderate	Slight	ML or CL over SP or GP	Moderate	Very poor: AAP < 8 in.	Medium	4 to 7
	Duric Camborthids - 0 to 10% slopes, gravelly (20%)	B	Moderately low	Moderate	SM	Moderate	Very poor: AAP < 8 in.	Slow to medium	4 to 7
	Inclusions (5%)								
30	Duric Camborthids - 11 to 25% slopes, very gravelly (35%)	B	Moderate	Moderate	SM	Moderate	Very poor: > 50% surface gravels and cobbles	Medium to rapid	4 to 10
	Duric Camborthids - 11 to 25% slopes, stony (35%)	B	Moderate	Slight	GM	Low	Poor: < 10 in. AAP, low AWHC, 15% surface stones	Slow to medium	4 to 10
	Torriorthents - 11 to 25% slopes, gravelly (20%)	B	Moderate	Severe	SM	Moderate	Poor: < 10 in. AAP	Medium to rapid	4 to 10
	Durorthids - 11 to 25% slopes, shallow (10%)	D	Moderate	Slight	SM or ML to hardpan	Low	Very poor: shallow to indurated pan	Medium to rapid	4 to 10
34	Xerollic Durorthids - 15 to 30% slopes, dissected (40%)	D	Moderate	Moderate	SM	Moderate	Fair: 20 to 40 in. root zone	Medium	12 to 15
	Xerollic Paleargids - 15 to 30% slopes (20%)	D	Moderate to high	Slight	GC or SC	Low	Poor: low AWHC, 15 to 30% slope gradient	Medium	12 to 15
	Typic Durorthids - 15 to 30% slopes, dissected (20%)	D	Moderate	Moderate	SM	Moderate	Fair: 20 to 40 in. root zone, 15 to 30% slope gradient	Medium	12 to 15
	Haploxerollic Durorthids - 15 to 30% slopes (10%)	D	Moderate	Moderate	ML or CL	Moderate	Fair: 20 to 40 in. root zone	Medium	12 to 15

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TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydro-logic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
	Typic Torripsamments - 4 to 15% slopes, dissected (10%)	A	Low	Severe	SP or SP-SM	Very low	Very poor: very low AWHC; severe wind erosion hazard	Very slow	12 to 15
35	Typic Camborthids - 0 to 10% slopes (30%)	B	Moderate	Slight	ML	High	Fair: < 12 in. AAP	Slow	8 to 12
	Xerollic Camborthids - 0 to 10% slopes (30%)	B	Slight to moderate	Moderate	SM or SC	Moderate	Fair: AAP < 12 in.	Slow to medium	8 to 12
	Xeric Torrifluvents - 0 to 10% slopes (30%)	B	Moderate	Slight	CL	High	Fair: AAP < 12 in.	Slow	8 to 12
	Inclusions (10%)								
36	Typic Camborthids - 0 to 10% slopes (50%)	B	Slight to moderate	Moderate	SM	Moderate	Very poor: < 8 in. AAP	Medium	4 to 7
	Typic Durargids - 0 to 10% slopes (30%)	D	Moderate	Slight	CH	Low to moderate	Very poor: shallow to pan, < 8 in. AAP	Medium	4 to 7
	Xerollic Haplargids - 0 to 10% slopes (15%)	B	Moderate	Slight	GM	Low to moderate	Very poor: < 8 in. AAP	Low to medium	4 to 7
	Inclusions (5%)								
37	Torriorthents - 0 to 8% slopes, gravelly, stony	B	Moderate	Slight	GM	Very low	Very poor: very low AWHC	Slow	12 to 15
40	Aridic Haploxerolls - 15 to 50% slopes, stony (30%)	C	Moderate to high	Slight	SM or GM	Moderate to low	Very poor: > 30% slope gradients; shallow to bedrock	Rapid	16 to 23
	Aridic Argixerolls - 8 to 50% slopes, stony (30%)	C	Moderate to high	Slight	SM or GM	Low	Very poor: > 30% slope gradients; shallow to bedrock	Rapid	16 to 23

PRELIMINARY DRAFT

TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydrologic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
	Lithic Xerollic Haplargids - 30 to 70% slopes, stony (15%)	D	Moderate to high	Slight	SM or GM	Very low	Very poor: >30% slope gradients, shallow to bedrock	Rapid	16 to 23
	Lithic Camborthids - 15 to 30% slopes, gravelly (15%)	D	Moderate to high	Moderate	SM or GM	Very low	Very poor: >30% slope gradients, shallow to bedrock	Rapid	16 to 23
	Inclusions (10%)								
41	Xerollic Paleargids - 4 to 15% slopes, gravelly and stony (35%)	D	Moderately low	Slight	CH	Moderately low	Poor: moderately low AWHC; >15% surface stones	Medium	4 to 11
	Xerollic Durargids - 2 to 8% slopes, gravelly and stony (45%)	C	Slight	Slight	CL over GM to pan	Low	Very poor: shallow to indurated pan; low AWHC	Medium	4 to 11
	Inclusions (20%)								
44	Lithic Xerollic Haplargids - 15 to 50% slopes (40%)	D	High	Slight	GC,CL	Very low	Very poor: shallow to bedrock; very low AWHC slope gradients >30%	Rapid	4 to 7
	Lithic Torriorthents - 8 to 50% slopes (20%)	D	Moderate to high	Severe	GM	Very low	Very poor: shallow to bedrock, very low AWHC slope gradients >30%	Medium	4 to 7
	Rock Outcrop (20%)								
	Inclusions (20%)								
48	Lithic Haplargids - 8 to 50% slopes, stony (35%)	D	High	Moderate	GC,SC	Very low	Very poor: shallow to bedrock, AAP<8 in., slope gradients >30%	Rapid	4 to 7
	Lithic Haplargids - 4 to 15% slopes, stony (25%)	D	Moderate	Slight	SC,CL	Low	Very poor: shallow to bedrock, AAP<8 in.	Medium	4 to 7

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TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydro-logic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
	Lithic Xerollic Haplargids - 4 to 15% slopes, stony (15%)	D	Moderately High	Moderate	GC	Very low	Very poor: very low AWHC, AAP<8 in., shallow to bedrock	Rapid	4 to 7
	Inclusions (25%)								
49	Duric Haplargids - 0 to 8% slopes, gravel substratum, stony (75%)	B	Low to moderate	Slight	SC,CL over GM	Low	Very poor: low AWHC, AAP<8 in.	Medium	4 to 7
	Inclusions (25%)								
56	Lithic Haplargids - 4 to 30% slopes, stony (40%)	D	Moderate to high	Slight	GC,CL	Very low	Very poor: shallow to bedrock, AAP<8 in., very low AWHC	Medium to rapid	4 to 7
	Rock Outcrop (30%)							Very rapid	4 to 7
	Lithic Haplargids - 4 to 30% slopes (20%)	D	Moderate to high	Slight	GC,CH	Very low	Very poor: shallow to bedrock, AAP<8 in., very low AWHC	Rapid	4 to 7
	Inclusions (10%)								
58	Typic Durargids - 0 to 4% slopes, shallow (50%)	D	Low	Slight	SC,CL	Very low	Very poor: shallow to hardpan, very low AWHC	Slow to medium	4 to 7
	Duric Haplargids - 4 to 15% slopes, gravel substratum, dissected (30%)	B	Moderate	Slight	SC,CL	Low	Very poor: AAP<8 in.	Medium	4 to 7
	Inclusions (20%)								
59	Typic Torriorthents - 2 to 8% slopes (40%)	A	Moderate	Severe	GM,SM	Very low to low	Very poor: very low AWHC, AAP<8 in.	Very slow	4 to 7
	Typic Torripsamments - 2 to 8% slopes (20%)	A	High	Severe	SP, SP-SM, SM	Low	Very poor: very low AWHC, AAP<8 in.	Very slow	4 to 7

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TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydrologic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
	Duric Haplargids - 4 to 15% slopes, stony (20%)	B	Moderate	Slight	SC	Low	Very poor: AAP < 8 in.	Medium	4 to 7
	Inclusions (20%)								
60	Rock Outcrop (50%)								
	Lithic Torripsamments - 30 to 50% slopes (20%)	D	High	Severe	SP,SM	Very low	Very poor: very low AWHC, AAP < 8 in. slope gradients > 30%	Very slow	4 to 7
	Xeric Torripsamments - 30 to 50% slopes, shallow (20%)	B	High	Severe	SP, SP-SM, SM	Very low	Very poor: very low AWHC, AAP < 8 in. slope gradients > 30%	Very slow	4 to 7
	Inclusions (10%)								
62	Lithic Haplargids - 4 to 15% slopes (40%)	D	Moderate	Slight	GC,SC	Very low	Very poor: shallow to bedrock, very low AWHC, AAP < 8 in.	Medium to Rapid	4 to 7
	Rock Outcrop (30%)								
	Typic Haplargids - 4 to 15% slopes, stony (20%)	B	Moderate	Slight	SC,CL	Low	Very poor: AAP < 8 in., low AWHC	Rapid	4 to 7
	Inclusions (10%)								
63	Typic Torriorthents - 0 to 2% slopes, flooded, saline (50%)	B	Low	Moderate	SM	Moderate	Very poor: E.C. X 10^3 >4	Slow	4 to 7
	Typic Torriorthents - 0 to 4% slopes (30%)	A	Low	Severe	SM	Low	Very poor: low AWHC, AAP < 8 in.	Very slow	4 to 7
	Inclusions (20%)								

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PRELIMINARY DRAFT

TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydro-logic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
64	Haplic Durargids - 2 to 8% slopes, shallow, very stony (40%)	D	Low to moderate	Slight	SC,CL	Very low	Very poor: shallow to hardpan, very low AWHC; AAP < 8 inches	Medium	4 to 7
	Typic Torriorthents - 2 to 8% slopes, stony (30%)	A	Low to moderate	Severe	GM,SM	Very low to low	Very poor: shallow to hardpan, very low to low AWHC, AAP < 8 in.	Very slow	4 to 7
	Typic Durargids - 2 to 8% slopes, shallow, stony (15%)	D	Low to moderate	Moderate	SC,CL	Very low	Very poor: shallow to hardpan; very low AWHC AAP< 8 in.	Slow	4 to 7
	Inclusions (15%)								
66	Duric Camborthids - 0 to 2% slopes (40%)	B	Low	Moderate	GM,SM	Low	Very poor: AAP< 8 in.; low AWHC	Slow	4 to 7
	Typic Camborthids - 0 to 2% slopes, saline (30%)	B	Low	Severe	SM	Moderate	Very poor: E.C.x10^3>4; AAP< 8 in.	Slow	4 to 7
	Entic Durorthids - 0 to 2% slopes, saline, shallow (20%)	D	Low	Slight	SM	Very low	Very poor: shallow to hardpan; very low AWHC; E.C.x10^3>4	Slow	4 to 7
	Inclusions (10%)								
67	Typic Torriorthents - 2 to 8% slopes, cobbly (40%)	B	Moderate	Slight	GM	Very low to low	Very poor: low to very low AWHC; AAP< 8 in.	Slow	4 to 7
	Typic Natrargids - 2 to 8% slopes, cobbly, shallow (20%)	C	Moderate	Slight	SC,CL	Low	Very poor: low AWHC, ESP 5-15%; AAP< 8 in.	Medium	4 to 7
	Duric Haplargids - 2 to 8% slopes, very stony (20%)	B	Moderate	Slight	SC,CL	Low	Very poor: low AWHC, AAP< 8 in.	Medium	4 to 7
	Inclusions (20%)								

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TABLE D-2
TONOPAH GRAZING ES STUDY AREA SOIL INTERPRETATIONS

Map Unit Symbol	Constituent Soils or Land Types in Map Unit & Approximate Proportions	Soil Hydrologic Group g/	Erosion Hazard f/ Water	Erosion Hazard f/ Wind	Unified Class i/	Available Water-Holding Capacity (AWHC) a/	Suitability for Rangeland Seeding e/	Runoff h/	Average Annual Precipitation (inches) (AAP) b/
68	Rock outcrop (40%)							Very rapid	4 to 7
	Lithic Xerollic Haplargids - 15 to 50% slopes (30%)	D	High	Slight	GC,SC	Very low	Very poor: very low AWHC, shallow to bedrock, AAP<8 in.	Medium to rapid	4 to 7
	Lithic Torriorthents - 15 to 50% slopes (20%)	D	High	Slight	GM,SM	Very low	Very poor: very low AWHC, shallow to bedrock, AAP<8 in.	Slow	4 to 7
	Inclusions (10%)								
72	Lithic Haplargids - 15 to 50% slopes (50%)	D	Moderate to high	Slight	GC,CL	Very low	Very poor: very low AWHC, shallow to bedrock, AAP<8 in.	Rapid	4 to 7
	Rock Outcrop (40%)								
	Inclusions (10%)								

Abbreviations Used in Table:
a/ AWHC - Available Water-Holding Capacity (See Appendix D-)
b/ AAP - Average Annual Precipitation (See Climate, Ch. II-)
c/ E.C. X 10^3 = Equivalent conductance in mmhos/cm.^{2}
d/ ESP = Exchangeable Sodium Percentage
e/ Criteria from "interim Guide for Rating Soils According to Their Soil Suitabilities for Rangeland Seedings-Nevada," USDA-SCS and USDI-BLM, August 11, 1971.
f/ Eroision hazard pertsins to a qualitative estimate of the potential for soil particles to be detached and transported by wind, water or other agents when benefits of protective plant cover is not present. Determination of erosion hazard is based on soil texture and other characteristics which affect detachability, infiltration, permeability, slope gradients, length and shape of slope, and content of coarse fragments.
g,h/ Criteria from U.S. Bureau of Land Management Manual 7312 - Soils (See Appendix D-)
i/ Criteria from Unified Soil Classification System for Roads, Airfields, Embankments and Foundations, MIL-STD-619B, 30pp., 1968.

TABLE D-3
ACREAGE BY SOIL ASSOCIATION
AND ALLOTMENT IN TONOPAH
STUDY AREA

Allotment	Soil Map Unit (Association)	Acreage
Ione	1	10,076
	2	6,606
	15	275
	16	20,066
	20	1,234
	21	3,252
	22	4,777
	23	11,253
	26	2,424
	28	290
	30	6,127
San Antone-Smoky	1	53,533
	2	51,472
	3	6,960
	4	11,312
	5	19,556
	6	39,500
	7	21,479
	8	3,530
	9	8,532
	12	245
	16	5,149
	17	294
	20	5,345
	26	5,639
	40	39,476
	44	1,716
	48	6,130
	49	1,078
	56	588
	58	5,394
	59	3,187
	60	4,904
	62	882
	63	2,304
	64	28,441
	66	32,366
	67	59,336
	68	6,179
	69	294
	72	4,217
	8	2,353

PRELIMINARY DRAFT

TABLE D-3
ACREAGE BY SOIL ASSOCIATION
AND ALLOTMENT IN TONOPAH
STUDY AREA (CONT.)

Allotment	Soil Map Unit (Association)	Acreage
Francisco	2	882
	3	3,187
	4	5,198
Darrough Hot Springs	3	343
	4	1,716
	5	686
	6	343
	9	4,854
Ralston-Monitor	1	36,679
	2	18,879
	3	30,453
	6	7,203
	7	49,673
	8	23,979
	9	5,982
	12	294
	15	6,962
	17	833
	21	1,029
	22	3,972
	24	11,423
	25	3,776
	26	9,709
	28	5,982
	29	343
	30	980
	40	14,466
	43	2,206
	44	3,334
	72	5,344
Hunts Canyon	1	23,978
	3	2,746
	7	2,108
	12	2,991
	21	1,078
	22	1,524
	26	5,198
	28	15,251
	29	3,972
	30	490
	40	17,153

PRELIMINARY DRAFT

TABLE D-3
ACREAGE BY SOIL ASSOCIATION
AND ALLOTMENT IN TONOPAH
STUDY AREA (CONT.)

Allotment	Soil Map Unit (Association)	Acreage
Stone Cabin	1	30,205
	2	4,413
	3	14,457
	6	6,473
	8	1,814
	14	2,402
	15	7,305
	21	6,669
	28	1,520
	40	37,710
	41	3,530
	67	60,857
Willow Creek	3	2,353
	15	5,933
	21	294
	40	11,426
Wagon Johnnie	1	2,550
	9	3,775
	15	25,449
	26	2,844
	34	8,532
	37	2,550
	40	9,511
Hot Creek	1	1,323
	2	20,203
	3	45,649
	7	6,423
	8	1,226
	11	7,944
	12	7,650
	13	20,253
	14	43,543
	15	4,903
	28	4,168
	34	14,220
	35	3,570
	36	2,157
	40	70,575
	41	3,383

PRELIMINARY DRAFT

TABLE D-3
ACREAGE BY SOIL ASSOCIATION
AND ALLOTMENT IN TONOPAH
STUDY AREA (CONT.)

Allotment	Soil Map Unit (Association)	Acreage
Reveille	1	3,824
	2	22,850
	3	22,803
	7	17,359
	8	2,991
	9	441
	11	83,315
	12	27,508
	13	17,995
	14	59,140
	20	3,776
	21	3,089
	40	16,330
	67	147
Nyala	3	833
	8	12,873
	10	19,616
	11	54,751
	12	28,160
	13	8,582
	14	18,057
Butterfield Springs	8	7,969
	10	12,873
	11	1,618
	12	8,275
	13	2,304
	14	23,294
Blue Eagle	10	9,195
	11	7,049
	12	5,345
	13	196
	14	2,010

PRELIMINARY DRAFT

TABLE D-4
ESTIMATED AVERAGE SEDIMENT YIELD BY SOIL SUBGROUP
WITHIN THE TONOPAH STUDY AREA

Soil Subgroup or Land Type	Present and Future* Acre feet/square mile/year
ENTISOLS	
Lithic Torriorthents	.20
Typic Torriorthents	.14
Durorthidic Torriorthents	.14
Xeric Torriorthents	.13
Aquic Torriorthents	.11
Lithic Torripsamments	.18
Typic Torripsamments	.21
Xeric Torripsamments	.22
Typic Torrifluvents (one phase is highly eroded)	.61
Xeric Torrifluvents	.27
ARIDISOLS	
Typic Durorthids	.17
Entic Durorthids	.14
Haploxerollic Durorthids	.15
Xerollic Durorthids	.15
Lithic Camborthids	.26
Typic Camborthids	.15
Duric Camborthids	.12
Durixerollic Camborthids	.16
Xerollic Camborthids	.15
Aquic Calciorthids	.11
Lithic Haplargids	.25
Typic Haplargids	.18
Duric Haplargids	.16
Lithic Xeric Haplargids	.26
Durixerollic Haplargids	.17
Lithic Xerollic Haplargids	.31
Xerollic Haplargids	.15

PRELIMINARY DRAFT

TABLE D-4
ESTIMATED AVERAGE SEDIMENT YIELD BY SOIL SUBGROUP
WITHIN THE TONOPAH STUDY AREA

Soil Subgroup or Land Type	Present and Future* Acre feet/square mile/year
Typic Durargids	.15
Haplic Durargids	.18
Haploxerollic Durargids	.15
Xerollic Durargids	.16
Typic Nadurargids	.18
Haplic Nadurargids	.14
Haploxerollic Nadurargids	.15
Typic Natrargids	.10
Duric Natrargids	.22
Durixerollic Natrargids	.27
Xerollic Natrargids	.27
Aquic Natrargids	.13
Xerollic Paleargids	.25
MOLLISOLS	
Aridic Haploxerolls	.19
Aridic Argixerolls	.20
Typic Calciaquolls	.17
INCEPTISOLS	
Aeric Halaquepts	.11
Rubbleland	.13
Rock Outcrop	.13
Playa	.19

* Future With or Without Proposed Action.

Sediment Yield Value for each soil subgroup was averaged among the various phases of the subgroup (i.e., saline, cobbly, gravelly, eroded, dissected, slopes).

PRELIMINARY DRAFT

TABLE D-5
MEAN SEDIMENT PRODUCTION (TONS/ACRE) FOR SIX PLANT COMMUNITIES AND FIVE SOIL SUBGROUPS AT COILS CREEK WATERSHED (AFTER BLACKBURN, 1973)

Application rate (in/hr)	Initial Soil Moisture Condition	Percent Ground Cover: 78	75	73	94	78	90
		Soil Subgroup and Slope: Xerollic Haplargids, 13%	Atruptic Xerollic Durargids, 3%	Xerollic Durargids, 1%	Pachic Argixerolls, 6%	Xerollic Haplargids, 6%	Typic Torriorthents, 3%
		Plant Community: Arar/ 2/ Pose	Arar/ Pose (Low)	Artr/ Pose/ Phdi	Sylo/ Artr/ Agsp/ Wymo	Artr/ Agsp/ Basa	Pimo/ Juos/ Arar/ Pose
		Sediment Production					
1.5 1/	Dry	0.34^{a}	0.26^{b}	0.16^{c}	0.11^{d}	0.06	0.01^{abcd}
		Arar/ Pose	Arar/ Pose (Low)	Artr/ Pose/ Phdi	Sylo/ Artr/ Agsp/ Wymo	Artr/ Agsp/ Basa	Pimo/ Juos/ Arar/ Pose
1.5 1/	Field Capacity	0.47^{a}	0.36^{d}	0.40^{b}	0.16^{abcd}	0.19^{a}	0.37^{c}

The mean occurring first with a letter superscript is significantly different from all other means having the same letter superscript (0.05 level).

1/ Mean values for the 60 min. test.
2/ Refers to plant community:

Arar/Pose = Bud sagebrush/Sandberg bluegrass
Arar/Pose (Low) = Bud sagebrush/Sandberg bluegrass
Artr/Pose/Phdi = Bud sagebrush/Sandberg bluegrass/Phacelia
Sylo/Artr/Agsp/Wymo = Snowberry/Big sagebrush/Bluebunch wheatgrass/Wooly wyethia
Artr/Agsp/Basa = Big sagebrush/Bluebunch wheatgrass/Arrowleaf balsam root
Pimo/Juos/Arar/Pose = Pinyon/Juniper/Bud sagebrush/Sandberg bluegrass

PRELIMINARY DRAFT

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TABLE D-5
MEAN SEDIMENT PRODUCTION (TONS/ACRE) FOR NINE PLANT COMMUNITIES AND SEVEN SOIL SUBGROUPS AT DUCKWATER WATERSHED (AFTER BLACKBURN, 1973)

Application rate (in/hr)	Initial Soil Moisture Condition	Percent Ground Cover	45	48	79	58	63	60	65	77	82
		Soil Subgroup and Slope	Typic Natrargid, 4%	Typic Torrifluvent, 1%	Entic Durorthid, 4%	Duric Haplargid, 2%	Haplic Durargid, 3%	Entic Durorthid, 4%	Xerollic Durargid, 4%	Haplic Durargids, 10%	Xerollic Haplargids, 6%
		Plant Community	Atco 2/	Eula	Arno/ Atco	Artr/ Chvi	Artr	Atco/ Eula	Arno	Juos	Pimo/ Juos
1.5 1/	Dry	Sediment Production	0.409[a]	0.324[b]	0.323[c]	0.298[d]	0.208[a]	0.188[f]	0.183[g]	0.029[abcd efgh]	0.004[abcd efgh]
		Plant Community	Atco	Eula	Arno/ Atco	Artr/ Chvi	Artr	Atco/ Eula	Arno	Juos	Pimo/ Juos
1.5 1/	Field Capacity	Sediment Production	0.303[d]	0.339[b]	0.323[c]	0.487[a]	0.282[f]	0.179[g]	0.288[e]	0.023[abcd efgh]	0.004[abcd efgh]

The mean occurring first with a letter superscript is significantly different from all other means having the same letter superscript (0.05 level).

1/ Mean values for 60 min. test.
2/ Refers to the plant community:

Atco = Shadscale
Eula = Winterfat
Arno/Atco = Black sagebrush/Shadscale
Artr/Chvi = Big sagebrush/Rabbitbrush
Artr = Big sagebrush
Atco/Eula = Shadscale/Winterfat
Arno = Black sagebrush
Juos = Juniper
Pimo/Juos = Pinyon/Juniper

PRELIMINARY DRAFT

TABLE D-5
MEAN SEDIMENT PRODUCTION (TONS/ACRE) FOR SIX PLANT COMMUNITIES AND FOUR SOIL SUBGROUPS AT STEPTOE WATERSHED

Application rate (in/hr)	Initial Soil Moisture Condition	Percent Ground Cover: 66	72	75	71	96	71
		Soil Subgroup and Slope: Xerollic Camborthids, 12%	Haploxerollic Durargids, 4%	Duric Argixeroll, 6%	Haploxerollic Durargids, 4%	Durixerollic Camborthids, 2%	Durixerollic Camborthids, 2%
		Plant Community: Pimo/ 2/ Juos	Artr/ Agsp	Artr Putr/ Agsp	Agde (High)	Artr	Agde (Low)
		Sediment Production					
1.5 1/	Dry	0.25[a]	0.07[b]	0.03	0.02	0.008[a]	0.003[ab]
		Pimo/ Juos	Artr/ Putr/ Agsp	Artr/ Agsp	Agde (High)	Artr	Agde (Low)
1.5 1/	Field Capacity	0.31[a]	0.24[b]	0.10	0.07	0.03[a]	0.02[ab]

The mean occuring first with a letter superscript is significantly different from all other means having the same letter superscript (.05 level).

1/ Mean values for 60 min. test.
2/ Refers to plant community:

Pimo/Juos = Pinyon/Juniper
Artr/Agsp = Big sagebrush/Bluebunch wheatgrass
Artr/Putr/Agsp = Big sagebrush/Antelope bitterbrush/Bluebunch wheatgrass
Agde = Agave
Artr = Big sagebrush

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TABLE D-6

POTENTIAL RANGE PRODUCTIVITY (AIR DRY HERBAGE) BY SOIL SUBGROUP WITHIN THE TONOPAH STUDY AREA

Soil Subgroup or Landtype	Dry Weight (lbs./Acre)*
ENTISOLS	
Lithic Torriorthents	225-500
Typic Torriorthents	150-350
Durorthidic Torriorthents	150-375
Xeric Torriorthents	250-500
Aquic Torriorthents	90-375
Typic Torriorthents (flooded and saline)	350-850
Lithic Torripsamments	225-500
Typic Torripsamments	250-450
Xeric Torripsamments	225-500
Typic Torrifluvents	200-500
Xeric Torrifluvents	200-500
ARIDISOLS	
Typic Durorthids	150-400
Entic Durorthids	150-400
Haploxerollic Durorthids	150-250**
Xerollic Durorthids	150-250
Lithic Camborthids	150-350**
Typic Camborthids	150-350
Duric Camborthids	150-400
Xerollic Camborthids	275-550**
Durixerollic Camborthids	275-550
Lithic Haplargids	225-500
Typic Haplargids	150-400
Duric Haplargids (very stony)	25-100
Duric Haplargids	275-575
Lithic Xeric Haplargids	150-250
Durixerollic Haplargids	300-650
Lithic Xerollic Haplargids	275-550
Xerollic Haplargids	500-800
Typic Durargids	225-500
Haplic Durargids	275-500
Haploxerollic Durargids	375-700
Xerollic Durargids	350-675
Typic Nadurargids	120-390
Haplic Nadurargids	120-390
Haploxerollic Nadurargids	120-390**
Typic Natrargids (cobbly)	25-100
Duric Natrargids (saline)	90-375

PRELIMINARY DRAFT

TABLE D-6

POTENTIAL RANGE PRODUCTIVITY (AIR DRY HERBAGE) BY SOIL SUBGROUP WITHIN THE TONOPAH STUDY AREA

Soil Subgroup or Landtype	Dry Weight (lbs./Acre)*
ARIDISOLS, continued	
Duric Natrargids	150-400
Durixerollic Natrargids	150-400**
Xerollic Natrargids	150-400**
Aquic Natrargids	90-375
Aquic Calciorthids	350-850
Xerollic Paleargids	375-700
MOLLISOLS	
Aridic Haploxerolls	500-800
Aridic Argixerolls	300-650
Typic Calcioaquolls	500-1500
INCEPTISOLS	
Aeric Haloquepts	200-800
MISCELLANEOUS LAND TYPES	
Rubble Land	0-100
Rock Outcrop	0
Playa	0

* Range between unfavorable and favorable moisture years.

** Estimated.

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APPENDIX D
SOILS TERMS AND DEFINITIONS

Permeability

Permeability is that quality of the soil which enables it to transmit water or air. Soil permeability can be quantified in terms of a rate of flow of water through a cross section of saturated soil in a given time. Permeability rates are expressed in inches per hour. The classes are as follows:

1. Slow: .06 to .20 inch per hour
2. Moderately slow: .20 to .60 inch per hour
3. Moderate: .60 to 2.00 inches per hour
4. Moderately rapid: 2.00 to 6.00 inches per hour
5. Rapid: 6.00 to 20.00 inches per hour

Available Waterholding Class Range

Class	Range of Available Waterholding Capacity to 4 Feet Depth, or to Hardpan or Bedrock
	(inches of water)
High	6
Moderate High	4.5-6
Moderate	3-4.5
Low	2.5-3
Very Low	2.5

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Surface Runoff

Surface runoff refers to the relative rate water flows over the surface of the soil. The classes are defined as follows:

1. Ponded: None of water added to the soil as precipitation or by flow from higher land escapes as runoff but must pass through the soil or evaporate. Areas are usually distinct depressions. (Ponding should be of sufficient duration to be injurious to crops.)

2. Very slow: Surface water flows away so very slowly that free water lies on the surface for long periods of time or enters immediately into the soil. Soils are usually nearly level or very open and porous. Water either evaporates or percolates through the soil.

3. Slow: Surface water flows away so slowly that free water covers the soil for significant periods or enters the soil rapidly and a large part of the water passes through the profile or evaporates. Slopes are very gentle and the water erosion hazard is slight.

4. Medium: Surface water flows away at such a rate that most of the water enters the soil profile and free water lies on the surface for only short periods. Most of the water is absorbed by the soil where it is used for plant growth or lost by evaporation or percolation. Under cultivation the water erosion hazard may be slight or moderate.

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5. Rapid: A large portion of the water moves rapidly over the surface of the soil and a small part moves through the soil profile. Soils are usually moderately steep to steep and have low infiltration capacities. Erosion hazard is moderate to high.

Very rapid: Surface water runs off nearly as fast as it is added and only a very small proportion of the water enters the soil. Soils are usually steep or very steep, have low infiltration capacities, and a high to very high erosion hazard.

Erosion Hazard

Erosion Hazard (water and wind) is a rating based on expected losses of surface soil when all vegetative cover including litter is removed. The classes are as follows:

1. Slight: little loss of soil material is expected. Minor sheet or rill erosion may occur.
2. Moderate: some loss of surface soil material can be expected. Rills, small gullies, and sheet erosion may occur.
3. Severe: considerable loss of surface soil material can be expected. Rills, numerous small gullies, and sheet erosion can occur.

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Criteria for Soil Phases

Slope Phases

Slope Classes by Gradient	Slope Names: Simple Slopes	Slope Names: Complex Slopes
0-2%	Level or Nearly Level	Level or Nearly Level
2-4%	Gently Sloping	Undulating
4-8%	Moderately Sloping	Gently Rolling
8-15%	Sloping	Rolling
15-30%	Moderately Steep	Hilly
30-50%	Steep	Steep
50-70%	Very Steep	Very Steep
70%	Extremely Steep	Extremely Steep

Depth to Bedrock or Hardpan Phases

Very Shallow: less than 10 inches to bedrock or hardpan.

Shallow: 10 to 20 inches to bedrock or hardpan.

(Lithic: less than 20 inches to hard bedrock; this designation appears as part of the soil Subgroup name.)

Gravel Substratum Phases

A gravel substratum is a subsurface layer at least 40 inches thick and containing more than 35 percent by volume of gravel and cobbles. This substratum may contain lenses of sand, and the fine earth in the pebble interstices commonly is sandy or loamy. Gravel substrata within two depth ranges are considered significant phase separations.

Shallow Gravel Substratum: a gravel substratum at less than 20 inches depth.

Gravel Substratum: a gravel substratum at 20 to 40 inches depth.

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Surface Stoniness Phases

Slightly Stony: 2 to 10 percent of the soil surface covered with cobbles, stones or boulders.

Stony: 10 to 25 percent of the soil surface covered with cobbles, stones, or boulders.

Flooded Phase

Soils subject to stream overflow, or flooding roughly 5 years in 10 or less; these soils occur in stream channels or on floodplains inherently subject to flooding.

Saline Phase

Soils with soluble salt contents great enough that the upper 20 inches have a salinity such that the saturation extract electrical conductivity is greater than 4 mmhos/cm. Such soils commonly have salt efflorescences on the surface and also are sodic. In the Dixie Valley area, saline soils commonly have pH values of 8.8 or greater.

Eroded Phase

Soils cut by numerous gullies and rills or with subsurface horizons or parent material exposed at frequent intervals.

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Meanings Of The Formative Elements In Names Of Soil Classes

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Formative Element	Example of Use	Meanings for Soils of Railroad Valley Area
arg	Durargids	With subsoil horizon of clay accumulation (argillic horizon)
aqu	Aquolls	With properties due to wetness
calc	Calciaquolls	With subsoil horizon of calcium carbonate accumulation (calcic horizon)
camb	Camborthid	With altered subsoil horizon
dur	Durargid	With silica-cemented hardpan (duripan)
ent	Torriorthent	Recent, without diagnostic horizons (one of the Entisols)
ent	Entic *Durorthid	With strongly cemented or discontinuous duripan
fluv	Torrifluvent	On an active floodplain
hapl	Haplargid	Simple, without special features
hapl	Haplic *Durargid	With strongly cemented or discontinuous duripan
id	Aridisol	An arid soil (one of the Aridisols)
lith	Lithic Haplargid	Shallow to hard bedrock
nadur	Nadurargids	With sodium-affected subsoil and a hardpan (natric horizon and duripan)
natr	Natrargid	With a sodium-affected subsoil horizon of clay accumulation (natric horizon)
oll	Xeroll	With a dark colored, thick surface horizon (mollic epipedon; one of the Mollisols)

orth	Camborthid	Common example (for Aridisols means without argillic horizon; for Entisols means not a sand texture)
pale	Paleargid	Old soil with very thick, clayey subsoil
psamm	Psamment	Very sandy soil; a sand
torr	Torriorthent	An arid soil (same degree of dryness as for Aridisols), mesic soil temperatures
typic	Typic Durorthid	Common example; without special features
xer	Xeroll	With a winter-moist and summer-dry soil moisture regime
xer	Xerollic *Durargid	A somewhat more moist soil than in the "typic" subgroup

*When this formative element is used in the adjectival portion of this particular Subgroup name, it has the particular meaning given here.

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APPENDIX E

WATER RESOURCES

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TABLE E-1
MONITOR WELL WATER QUALITY

As part of the Energy Research and Development Administration (formerly the Atomic Energy Commission) work in Central Nevada, a well was drilled in Monitor Valley, T. 12N, R. 47E., Section 8. The well is 4,353 feet deep and cased with 20-inch casing to 52 feet and 13-3/8-inch casing to 1,687 feet. Flow is hot water (118°F.) with a static water level of +20 feet and a flow rate of 745 gallons/minute.

The following water analysis information was obtained from ERDA (then AEC) in the early 1970's:

Conductivity micromhos/cm^2	1,000
Salt parts/million	700
pH	8.6
Cations (equiv./million):	
Calcium	None
Magnesium	3.9
Sodium	6.1
Potassium	None
TOTAL CATIONS	10.0
Anions (equiv./million):	
Carbonate	None
Bicarbonate	6.14
Sulphate	3.32
Chloride	.54
Boron (p.p.m.)	.20

Overall rating is fair for irrigation and fair for livestock use.

NOTE: cm = centimeter,
equiv. = equivalents

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Illustrations - Water Development Maps. Maps show springs, pipelines, and wells in the Tonopah study area.

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APPENDIX F

VEGETATION

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TABLE F-1

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COMMON VEGETATIVE SPECIES
(In Tonopah Study Area)

Common Name	Scientific Name
	Trees
Singleleaf pinyon	Pinus monophylla
Utah juniper	Juniperus steosperma
Quaking aspen	Populus tremaloides
Curlleaf mountain mahogany	Cercocarpus ledifolius
Rocky Mountain juniper	Juniperus scopulorum
Chokecherry	Prunus Virginiana
Willow	Salix
	Shrubs
Serviceberry	Amelanchier utahensis
Low sagebrush	Artemisia arbuscula
Black sagebrush	Artemisia nova
Bud sagebrush	Artemisia spinescens
Big sagebrush	Artemisia tridentata
Fourwing saltbrush	Atriplex canescens
Shadscale	Atriplex confertifolia
Rabbitbrush	Chrysothamnus sp.
Cliffrose	Cowiana
Nevada ephedra	Ephedra nevadensis
Winterfat (white sage)	Eurotia lanata
Spiny hopsage	Grayis spinosa
Prickly-pear cactus	Opuntia
Antelope bitterbrush	Purshia tridentata
Greasewood	Sarcobatus vermiculatus
Snowberry	Symphoricarpos
Horsebrush	Tetradymia glabrata
	Forbs
Western yarrow	Achillea
Wild onion	Allium
Milkweed	Asclepias
Locoweed	Astragalus
Arrowleaf balsamroot	Balsamorhiza sagittata
	Coldenia plicata
Larkspur	Delphinium andersonii
	Chenopodium incanum
Tansy mustard	Descurainia sp.
	Eriastrom diffusum
Fleabane	Erigeron sp.

Common Name	Scientific Name
	Forbs (cont'd)
Eriogonum	Eriogonum sp.
Gilia	Gilia latifolia
Halogeton	Halogeton glomeratus
Sunflower	Helianthella
Green molly	Kochia americana
Pepperweed (tar weed)	Lepidium
Lupine	Lupinus sp.
Alfalfa	Medicago satira
White sweetclover	Melilotus alba
Yellow sweetclover	Melilotus officinalis
Evening primrose	Oenothera sp.
Penstemon	Penstemon sp.
Phlox	Phlox sp.
Cinquefoil	Potentilla sp.
Buttercup	Ranunculus sp.
Russian thistle	Salsola kali
Groundsel	Senscio sp.
Tumble mustard	Sisymbrium altissimum
Desert globemallow	Sphaeralcea ambigua
Gooseberryleaf globemallow	Sphaeralcea grossulariaefolia
Dandelion	Taraxacum officinale
Clover	Trifolium
Cattail	Typha hatifolia
Violet	Viola sp.
Mulescar wyethia	Wyethia amplexicaulis
Death camas	Zigadenas paniculatus
	Grasses
Fairway crester wheatgrass	Agropyron cristatum
Standard crested wheatgrass	Agropyron desertorum
Quakegrass	Agropyron repens
Western wheatgrass	Agropyron smithii
Smooth brome	Bromus inermus
Cheatgrass	Bromus tectorum
	Bouteloua barbata
Orchardgrass	Dactylis glomerata
Salt grass	Distichlis spicata
Greatbasin wildrye	Elymus cinereus
Russian wildrye	Elymus junceus

PRELIMINARY DRAFT

Common Name	Scientific Name
	Grasses (cont'd)
Galleta	Hilaria jamesii
Foxtail barley	Hordeum jubatum
Junegrass	Koelaria cristata
Indian ricegrass	Oryzopsis hymenoides
Timothy	Phleum partense
Reed canarygrass	Phragmites communis
Reed bluegrass	Poa sp.
Squirreltail	Sitanion hystrix
Alkali sucaton	Sporobolus giroides
Sand dropseed	Sporobolus crytandrus
Needlegrass	Stipa sp.
Spike trisetum	Trisetum spicatum
	Grasslike
Sedges	Carey spp.
Spikerush	Eleocharis spp.
Rushes	Juncus spp.
Bulrushes	Scirpus spp.

PRELIMINARY DRAFT

APPENDIX G

WILDLIFE

PRELIMINARY

DRAFT

TABLE G-1
WILDLIFE SPECIES AND RELATIVE HABITAT PREFERENCE
FOR THE TONOPAH STUDY AREA

Mammals	Relative Abundance	Habitat Types: Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Belding Ground Squirrel Citellus beldingi									
Golden-mantled Squirrel Citellus lateralis	C			PR		PR	PR	PR	
Whitetail Antelope Squirrel Ammospermophilus leucurus	C	PR	PR	PR		PR			
Least Chipmunk Eutamias minimus	C	PR	PR	PR	PR	PR	PR		
Cliff Chipmunk Eutamias dorsalis	C					PR			
Unita Chipmunk Eutamias umbrinus	C				PR	PR	PR	PR	
Valley Pocket Gopher Thomomys bottae	C	PR	PR	PR					
Northern Pocket Gopher Thomomys talpoides	C				PR		PR	PR	
Townsend Pocket Gopher Thomomys townsendi									
Little Pocket Mouse Perognathus longimembris	C	PR	PR	PR		PR			
Great Basin Pocket Mouse Perognathus parvus	C	PR	PR	PR		PR			
Longtail Pocket Mouse Perognathus formosus	C	PR	PR	PR		PR			
Dark Kanagaroo Mouse Microdipodops megacephalus	C	PR	PR	PR					
Ord Kangaroo Rat Dipodomys ordi	C	PR	PR	PR		PR			
Great Basin Kangaroo Rat Dipodomys microps	C	PR	PR						
Western Harvest Mouse Reithrodontomys megalotis	C	PR	PR	PR		PR			

PRELIMINARY DRAFT

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Mammals	Relative Abundance	Habitat Types							
		Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Canyon Mouse									
Peromyscus crinitus	C							PR	
Deer Mouse									
Peromyscus maniculatus	A	PR	PR	PR	PR	PR	PR		
Pinyon Mouse									
Peromyscus truei	C					PR			
Northern Grasshopper Mouse									
Onychomys leucogaster	FC	PR	PR	PR		PR			
Desert Woodrat									
Neotoma lepida	FC	PR	PR	PR				PR	
Bushytail Woodrat									
Neotoma cinerea	C					PR	PR	PR	
Mountain Vole									
Microtus montanus	U		PR						
Vagrant Shrew									
Sorex vagrans	C							PR	
Northern Water Shrew									
Sorex palustris	C							PR	
Little Brown Myotis									
Myotis lucifugus	FC				SR	SR	SR	SR	
Long-eared Myotis									
Myotis evotis	FC		SR		SR	SR		SR	
Long-legged Myotis									
Myotis volans	FC				SR	SR		SR	
Small-footed Myotis									
Myotis subulatus	FC					SR		SR	
Big Brown Bat									
Eptesicus fuscus	FC		SR		SR	SR		SR	
Western Big-eared Bat									
Plecotus townsendi	FC	SR	SR	SR		SR		SR	
Pallid Bat									
Antrozous pallidus	U	SR	SR	SR					
Mexican Freetail Bat									
Tadarida brasiliensis	U	SR	SR	SR		SR		SR	
Ringtail									
Bassariscus astutus	U			PR				PR	

PRELIMINARY DRAFT

Mammals	Relative Abundance	Habitat Types							
		Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Shorttail Weasel									
Mustela erminea	R				PR		PR		
Longtail Weasel									
Mustela frenata	U	PR	PR	PR	PR	PR			
Badger									
Taxidea taxus	C	PR	PR	PR	PR	PR			
Spotted Skunk									
Spilogale putorius	U		PR	PR	PR	PR		PR	
Coyote									
Canis latrans	C	PR	PR	PR	SR	PR	SR		
Kit Fox									
Vulpes macrotis	U	PR	PR	PR					
Gray Fox									
Urocyon cinereoargenteus	U		PR	PR	PR	PR			
Mountain Lion									
Felis concolor	U		PR	PR	PR	PR		PR	
Bobcat									
Lynx rufus	C	PR	PR	PR	PR	PR		PR	
Yellowbelly Marmot									
Marmota flaviventris	U	PR	PR	PR	PR	PR	PR	PR	
Rock Squirrel									
Citellus variegatus	U		PR			PR		PR	
Townsend Ground Squirrel									
Citellus townsendi	C	PR	PR	PR		PR			
Longtail Vole									
Microtus longicaudus	C		PR	PR					
Sagebrush Vole									
Lagurus curtatus	U		PR	PR		PR			
House Mouse									
Mus musculus	Usually in or near buildings								
Porcupine									
Erethizon dorsatum	FC				PR	PR	PR	PR	
Pika									
Ochotona princeps								PR	
Blacktail Jackrabbit									
Lepus californicus	C	PR	PR	PR	PR	PR	PR		
Mountain Cottontail									
Sylvilagus nuttalli	C		PR	PR		PR		PR	

Habitat Types

Mammals	Relative Abundance	Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Pygmy Rabbit									
Sylvilagus idahoensis	C	PR	PR			PR			
Mule Deer									
Odocoileus hemionus	C		PR	PR	SR	PR	SR		
Pronghorn									
Antilocapra americana	U		PR	PR		PR			
Bighorn Sheep (UN)									
Ovis canadensis	U	WR	WR	WR		WR	SR	PR	

PRELIMINARY DRAFT

TABLE G-2
WILDLIFE SPECIES AND RELATIVE HABITAT PREFERENCE
FOR THE TONOPAH STUDY AREA

Birds	Relative Abundance	Habitat Types: Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Eared Grebe Podiceps caspicus	U								SR
Western Grebe Aechmophorus occidentalis	U								SR
Pied-Billed Grebe Podilymbus podiceps	C								TV
Great Blue Heron Ardea herodias	C								SR
Common Egret Casmerodius albus	C								SR
Snowy Egret Leucophoyx thula	C								SR
Black-Crowned Night Heron Nycticorax nycticorax	U								SR
American Bittern Botaurus lentiginosus	U								SR
Mallard Anas platyrhynchos	U								SR
Gadwall Anas strepera	U								SR
Pintail Anas acuta	U								SR
Green-winged Teal Anas carolinensis	U								SR
Blue-winged Teal Anas discors	U								SR
Cinnamon Teal Anas cyanoptera	U								SR
American Widgeon Mareca americana	U								TV
Shoveler Spatula clypeata	U								TV
Redhead									

Birds	Relative Abundance	Habitat Types								
		Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Redhead									
Aythya americana	U								TV
Ring-necked Duck									
Aythya collaris	U								TV
Canvasback									
Aythya valisinerla	U								TV
Lesser Scaup									
Aythya affinis	U								TV
Common Goldeneye									
Bucephala clangula	U								TV
Bufflehead									
Bucephala albeola	U								TV
Great Horned Owl									
Bubo virginianus	FC			PR	PR	PR			
Pygmy Owl									
Glaucidium gnoma	R						SR		
Burrowing Owl (U)									
Speotyto cunicularia	U		SR	SR					
Long-eared Owl									
Asio otus	U		SR	SR					
Short-eared Owl									
Asio flammeus	FC		SR	SR					
Saw-whet Owl					T				
Aegolius acadicus	U				U				
Poor-Will									
Phalaenoptilus nuttallii	FC								
Common Nighthawk									
Chordeiles minor	FC		SR			SR			
Vaux's Swift									
Chaetura vauxi									
White-throated Swift								T	
Aeronautes saxatalis	R							R	
Broad-Tailed Hummingbird									
Selasphorus platycercus	FC				SR				
Rufous Hummingbird									
Selasphorus rufus	U						SR		
Calliope Hummingbird									
Stellula calliope	U				SR		SR		

Birds	Relative Abundance	Habitat Types: Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Belted Kingfisher									
Megaceryle alcyon	U								SR
Red-Shafted Flicker									
Colaptes cafer	C				SR	SR	SR		
Lewis' Woodpecker						T			
Asyndesmus lewis	U					U			
Yellow-Bellied Sapsucker									
Sphyrapicus varius	FC				SR	SR			
Hairy Woodpecker									
Dendrocopos villosus	FC				SR	SR	SR		
Downy Woodpecker									
Dendrocopos pubescens	U				SR				
Western Kingbird									
Tyrannus verticalis	C		SR			SR			
Ash-Throated Flycatcher									
Myiarchus cinerascens									
Say's Phoebe									
Sayornis saya	U					SR			
Traill's Flycatcher									
Empidobax traillii	U				SR	SR			
Ruddy Duck									
Oxyura jamaicensis	U								TV
Hooded Merganser									
Lophodytes cucullatus	U								TV
Common Merganser									
Mergus merganser	U								TV
Red-breasted Merganser									
Mergus serrator	R								TV
Turkey Vulture									
Cathartes aura	U	SR						SR	
Goshawk									
Accipiter gentilis	R				SR				
Sharp-shinned Hawk									
Accipiter striatus	U	SR	SR	SR		SR			
Cooper's Hawk									
Accipiter cooperii	FC				SR				

PRELIMINARY DRAFT

Birds	Relative Abundance	Habitat Types								
		Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Red-tailed Hawk									
Buteo jamaicensis	FC	SR	SR			SR		SR	
Swainson's Hawk									
Buteo swainsoni	FC		SR			SR			
Rough-legged Hawk									
Buteo lagopus	FC		SR			SR			
Ferruginous Hawk (U)									
Buteo regalis	U		PR		PR	PR			
Golden Eagle									
Aquila chrysaetos	C	PR	PR	PR	PR	PR	PR	PR	PR
Marsh Hawk									
Circus cyaneus	FC		SR			SR			
Peregrine Falcon (E)									
Falco peregrinus	R							SR	
Prairie Falcon (U)									
Falco mexicanus	R	SR	PR			PR		PR	
Pigeon Hawk									
Falco columbarius	R		SR			SR			
Sparrow Hawk									
Falco sparverius	C	SR		SR		SR		SR	
Blue Grouse							PR		
Dendragapus obscurus	C						C		
Sage Grouse									
Centracercus urophasianus	FC		SR	WV					
California Quail (I)									
Lophortyx californicus	U		PR						
Scaled Quail									
Callipepla squamata	U	PR							
Chukar (I)									
Alectoris graeca	FC		PR			PR		PR	
American Coot									
Fulica americana	C								SR
Killdeer									
Charadrius vociferus	C								SR

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Birds	Relative Abundance	Habitat Types							
		Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Common Snipe									
Capella gallinago	U								SV
Long-billed Curlew									
Numenius americanus	U								
Spotted Sandpiper									
Actitis macularia	C								
Greater Yellowlegs									
Totanus melanoleucus	U								TV
Least Sandpiper									
Erolia minutilla	C								TV
Western Sandpiper									
Ereunetes mauri	C								TV
American Avocet									
Recurvirostra americana	U								TV
Black-necked Stilt									
Himantopus mexicanus	C								SR
Wilson's Phalarope									
Steganopus tricolor	U								TV
Northern Phalarope									
Lobipes lobatus	U								TV
California Gull									
Larus californicus	U								SR
Ring-billed Gull									
Larus delawarensis	U								SR
Forster's Tern									
Sterna forsteri	U								SR
Black Tern									
Chilidonias niger	U								SR
Rock Dove									
Columba livia	C								
Mourning Dove									
Zenaidura macroura	C	SR	SR	SR	SR	SR			SR
Barn Owl									
Tyto alba	C	PR	PR	PR					
Screech Owl									
Otus aslo	U				SR	SR	SR		
Flammulated Owl									
Otus flammeolus	R				SR		SR		

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Birds	Relative Abundance	Habitat Types: Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Common Snipe									
Capella gallinago	U								SV
Long-billed Curlew									
Numenius americanus	U								
Spotted Sandpiper									
Actitis macularia	C								
Greater Yellowlegs									
Totanus melanoleucus	U								TV
Least Sandpiper									
Erolia minutilla	C								TV
Western Sandpiper									
Ereunetes mauri	C								TV
American Avocet									
Recurvirostra americana	U								TV
Black-necked Stilt									
Himantopus mexicanus	C								SR
Wilson's Phalarope									
Steganopus tricolor	U								TV
Northern Phalarope									
Lobipes lobatus	U								TV
California Gull									
Larus californicus	U								SR
Ring-billed Gull									
Larus delawarensis	U								SR
Forster's Tern									
Sterna forsteri	U								SR
Black Tern									
Chilidonias niger	U								SR
Rock Dove									
Columba livia	C								
Mourning Dove									
Zenaidura macroura	C	SR	SR	SR	SR	SR			SR
Barn Owl									
Tyto alba	C	PR	PR	PR					
Screech Owl									
Otus aslo	U				SR	SR	SR		
Flammulated Owl									
Otus flammeolus	R				SR		SR		

PRELIMINARY DRAFT

Birds	Relative Abundance	Habitat Types: Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Hammond's Flycatcher									
Cmpidonax hammondii	U				SR	SR			
Dusky Flycatcher									
Empidonax oberholseri	FC				SR	SR	SR		
Gray Flycatcher									
Empidonax wrightii	FC		SR						
Western Flycatcher									
Empidonax difficills	U				SR	SR			
Western Wood Pewee									
Contopus sordidulus	FC				SR		SR		
Olive-Sided Flycatcher									
Nuttallornis borealls	U				T		T		
Horned Lark									
Eremophila alpestris	A		PR	PR					
Violet-Green Swallow									
Tachycineta thalassina	C				SR				
Tree Swallow									
Iridprocne bicolor	C				SR				
Bank Swallow					T				
Riparia riparia	U				U				
Rough-Winged Swallow									
Stelgidopteryx ruficollis	U				T				
Barn Swallow									
Hirundo rustica	C		SR	SR					
CLiff Swallow									
Petrochelidon pyrrhonota	C								SR
Scrub Jay									
Aphelocoma coerulescens	C					PR			
Black-Billed Magpie									
Pica pica	C	PR	PR	PR	PR	PR	T		
Common Raven									
Corvus corax	FC	PR	PR	PR	PR	T			
Common Crow									
Corvus brachyrhynchos	FC				PR				

PRELIMINARY DRAFT

Birds	Relative Abundance	Habitat Types: Shadscale	Wyoming big sagebrush	Black' sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Pinyon Jay									
Symnorhinus cyanocephala	C					PR			
Clark's Nutcracker									
Nucifraga columbiana	FC					PR	PR		
Mountain Chickadee									
Parus gambeli	C				PR	PR	PR		
Plain Titmouse									
Parus Inornatus	U					SR			
Common Bushtit									
Psaltriparus minimus	FC		WR		SR	SR			
White-Breasted Nuthatch									
Sitha carollnensis	U				SR		SR		
Red-Breasted Nuthatch									
Sitta canadensis	U				SR		SR		
Brown Creeper									
Certhia familiaris	U				SR		SR		
Dipper									
Cinclus mexicanus	U								
House Wren									
Troglodytes aedon	FC				SR				
Canon Wren									
Catherpes mexicanus	R							SR	
Rock Wren									
Salpinctes obsoletus	C							SR	
Mockingbird									
Mimus polyglottos	U	SR	SR						
Sage Thrasher									
Oreoscoptes montanus	C			SR					
Robin									
Turdus migratorius	C				SR	SR			
Hermit Thrush									
Hylocichla guttata	FC				SR				
Swainson's Thrush									
Hylocichla ustulata	U				SR				

PRELIMINARY DRAFT

Birds	Relative Abundance	Habitat Types: Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Myrtle Warbler									
Dendroicia coronata	R				SR		SR		
Audubon's Warbler									
Dendroica auduboni	C				SR		SR		
Black-throated Gray Warbler									
Dendroica nigrescens	C					SR			
Townsend's Warbler									
Dendroica townsendi	C				SR	SR			
Hermit Warbler									
Dendroica occidentalis	U				T	T			
MacGillivray's Warbler									
Oporornis tolmiel	C								SR
Yellowthroat									
Geothlypis trichas	U								SR
Yellow-Breasted Chat									
Icteria virens	C								SR
Wilson's Warbler									
Wilsonia pusilla	C								SR
House Sparrow (I)									
Passer domesticus	A				PR	PR			PR
Western Meadowlark									
Sturnella neglecta	U		SR	SR		SR			
Yellow-Headed Blackbird									
Xanthocephalus xantho-cephalus	C								SR
Red-Winged Blackbird									
Agelaius phoeniceus	C								SR
Bullock's Oriole									
Icterus bullockii	U				SR				SR
Brewer's Blackbird									
Euphagus cyanocephalus	FC		SR						
Brown-Headed Cowbird									
Molothrus ater	FC								SR
Western Tanager									
Piranga ludoviciana	C				SR				

PRELIMINARY DRAFT

Birds	Relative Abundance	Habitat Types: Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Black-Headed Grosbeak									
Pheucticus melanocephalus	U				SR				
Indigo Bunting									
Passerina cyanea	R		T						T
Lazull Bunting									
Passerina amoena	C								SR
Evening Grosbeak									
Hesperiphona vespertina	U								T
Cassin's Finch									
Carpodacus cassinii	C				SR		SR		
House Finch									
Carpodacus mexicanus	C					SR			
Gray-Crowned Rosy Finch									
Leucosticte tephrocotis	U		WR						
Pine Siskin									
Spinus pinus	C						SR		
American Goldfinch									
Spinus tristis	U					SR			
Lesser Goldfinch									
Spinus psaltria	U				SR	SR			
Red Crossbill									
Loxia curvirostra	R				SR				
Green-Tailed Towhee									
Chlorura chlorura	C					SR			
Rufous-Sided Towhee									
Pipilo crythrophthalmus	C				SR	SR			
Savannah Sparrow									
Passerculus sandwichensis	C								SR
Vesper Sparrow									
Pooecetes gramineus	C		SR						
Lark Sparrow									
Chondestes grammacus	C		SR	SR					
Black-Throated Sparrow									
Amphispiza bilineata	C		SR						
Sage Sparrow									
Amphispiza belli	C		SR	SR					

PRELIMINARY DRAFT

Birds	Relative Abundance	Habitat Types: Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Slate-Colored Junco									
Junco hyemalis	R						T		
Oregon Junco									
Junco oreganus	C		SR	SR	SR	SR			
Gray-Headed Junco									
Junco caniceps	C				SR	SR	SR		
Tree Sparrow									
Spizzela arborea	R		WV						
Chipping Sparrow									
Spizella passerina	C		SR	SR			SR	SR	
Brewer's Sparrow									
Spizella breweri	A		SR	SR	SR	SR			
White-Crowned Sparrow									
Zonotrichia leucophrys	C		T		T	T	SR		
Fox Sparrow									
Passerella iliaca	C								
Lincoln's Sparrow									
Melospiza lincolnil	U								
Song Sparrow									
Melospiza melodia	C								

PRELIMINARY DRAFT

TABLE G-3
WILDLIFE SPECIES AND RELATIVE HABITAT PREFERENCE
FOR THE TONOPAH STUDY AREA

Reptiles and Amphibians	Habitat Types: Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Western Spadefoot Toad Scaphlopus hammondi	X	X						
Great Basin Spadefoot Toad Scaphiopus Intermontanus		X			X	X		
Boreal Toad Bufo boreas boreas	X	X	X	X	X	X		X
Pacific Treefrog Hyla regilla	X	X	X					
Red-legged Frog Rana aurora		X		X	X			X
Leopard Frog Rana pipiens								X
Spotted Frog Rana pretiosa								X
Zebra-tailed Lizard Callisaurus craconoides	X							
Long-nosed Leopard Lizard Crotophytus wislizeni wislinzeni	X	X						
Great Basin Fence Lizard Sceloporus occidentalis biserlatus	X	X	X		X	X	X	
Northern Sagebrush Lizard Sceloporus graciosus graciosus		X	X		X	X		
Northern Side Blotched Lizard Uta stansburiana stansburiana								

PRELIMINARY DRAFT

Reptiles and Amphibians	Habitat Types							
	Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Northern Desert Horned Lizard Phyronosoma platyrhinos platyrhinos	X		X					
Salt Lake Horned Lizard Phyronosoma douglassi ornatum	X	X	X		X	X		
Great Basin Skink Eumeces skiltonianus utahensis		X	X		X		X	
Great Basin Whiptail Cnemidophorus tigris tigris	X	X			X			
Rocky Mountain Rubber Boa Charina bottae utahensis				X		X		
Western Yellow-bellied Racer Coluber constrictor mormon			X			X	X	
Red Racer Mastiophis flagellum piceus	X	X	X		X	X	X	
Desert Striped Whipsnake Masticophis taeniatus taeniatus	X	X	X		X	X	X	
Great Basin Gopher Snake Pltuophis melanoleucus deserticola	X	X	X	X	X	X		
Valley Garter Snake Thamnophis sirtalis fitchi				X				
Wandering Garter Snake Thamnophis elegans vagrans		X		X		X		X
Western Ground Snake Sonora semiannulata	X	X	X	X	X	X	X	

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Reptiles and Amphibians	Habitat Types							
	Shadscale	Wyoming big sagebrush	Black sagebrush	Aspen	Pinyon-Juniper	Limber pine	Cliff and rock	Lakes, ponds, and streams
Desert Night Snake Hypsiglena torquata deserticola	X	X					X	
Great Basin Rattlesnake Crotalus viridis lutosus		X		X	X	X	X	

PRELIMINARY DRAFT

TABLE G-4
SAGE GROUSE STRUTTING GROUND LOCATION SUMMARY

PRELIMINARY DRAFT

AREA 16 Nye Count

Ground Name and Area	Location	How Located	Status	Year When Last Coun
MONITOR VALLEY				
1. Hooper's Stone House Ranch	T 9N R46E Sec. 34 SW¼		A	1975
2. Pasco Canyon	T11N R46E Sec. 6	Aerial	A	1975
3. Pine Creek	T11N R46E Sec. 20	?	A	1975
4. Barley Creek	T 9N R47E Sec. 16	?	U	?
5. White Rock	T 8N R46E Sec. 12	3 Grounds	U	1969
6. Rattlesnake Butte	T 9N R45E Sec. 15	?	U	1971
7. Mosquito Creek	T11N R47E Sec. 4 SW¼	?	U	1971
8. Willow Creek	T14N R48E Sec. 22 NW¼	?	A	1971
9. Pott's Ranch Reseeding	T14N R48E Sec. 5 NE¼	?	A	1971
10. Long Canyon Number 1	T15N R48E Sec. 35 SW¼	?	A	1971
11. Long Canyon Number 2	T15N R48E Sec. 35 SW¼	?	A	1971
12. White Sage Spring	T15N R48E Sec. 20 SE¼	?	A	1971
13. White Sage Canyon	T15N R48E Sec. 13 NW¼	?	A	1971
14. Stoneberger Creek	T15N R46E Sec. 31 SE¼	?	A	1971
15. Clipper Gap	T15N R45E Sec. 8 SW¼	?	U	1970
16. USFS Spring Corral Canyon	T15N R46E Sec. 18 SW¼	?	U	1971
17. Stone House Upper Grd.	T10N R46E Sec. 33 N½			
18. Stone House Lower Grd.	T10N R46E Sec. 33 S½			
19. Meadow Creek	T10N R45E Sec. 22 SW¼			
20. Table Mountain Number 1	T10N R48E Sec. 6 SW¼			
21. Table Mountain Number 2	T10N R48E Sec. 19 E½			
22. Belmont South	T 8N R45E Sec. 4 NE¼			
LITTLE FISH LAKE VALLEY				
1. South Clover Creek	T10N R49E Sec. 33 NW¼		A	1975
2. Clover Creek	T10N R49E Sec. 21 NW¼SE¼	3 Grounds	A	1975
3. Green Monster	T11N R49E Sec. 33 W½		U	1975
4. Lower Danville	T11N R49E Sec. 34 NW¼		A	1975
5. Lower Clear Creek	T11N R49E Sec. 2 SE¼	Aerial (2 Grounds)	A	1975
6. Upper Clear Creek	T12N R49E Sec. 27 SE¼	(2 Grounds)	U	1975
7. Tule Canyon	T12N R49E Sec. 27 NW¼		A	1973
8. Stargo Canyon	T13N R50E Sec. 31 NW¼		A	1975
9. Allotment Fence	T13N R50E Sec. 29 SW¼	(2 Grounds)	U	1973
10. E. Savory Creek	T13N R50E Sec. 22 0	(3 Grounds)	A	1975
LITTLE SMOKY VALLEY				
1. Willow Creek	T14N R51E Sec. 25 NE¼		A	?
2. Cottonwood Creek	T14N R52E Sec. 16 NW¼		A	?

TABLE G-5
SAGE GROUSE STRUTTING GROUND LOCATION SUMMARY

AREA 17 Nye County

Ground Name and Area	Location	Status		Year When Last Counted
REESE RIVER VALLEY	N			
1. Tierney Creek	T14 R41E Sec. 11 NW¼	A		1971
2. Marysville Canyon	T14 R41E Sec. 21 NW¼	A		1973
3. New York Canyon	T14 R41E Sec. 33 SW¼	A		1971
4. Mohawk Canyon	T13 R41E Sec. 5 SW¼	A		1973
INDIAN VALLEY				
Indian Valley	T10N R40E Sec. 5 NE¼	A		1973
Cloverdale Summit	T10N R40E Sec. 5 SW¼	A		1973
TOIYABE RANGE				
1. Mahogany Hill Number 3	T10N R40E Sec. 3 NE¼	A		1972
2. Barney Meadows West	T10N R40E Sec. 25 SW¼	A		1972
3. Barney Meadows North	T10N R41E Sec. 17 NW¼	A		1972
4. Tom's Canyon Pass	T10N R41E Sec. 2 SW¼	A		1972
5. Head of Wall Canyon	T10N R42E Sec. 30 NE¼	A		1972
6. Last Chance Peak	T10N R39E Sec. 1 SW¼	A		1972
7. Mahogany Hill Number 1	T11N R40E Sec. 36 NW¼	A		1972
8. Mahogany Hill Number 2	T11N R40E Sec. 36 SW¼	A		1972
9. North Indian Valley	T11N R40E Sec. 21 SE¼	A		1972
10. Middle Indian Valley	T11N R40E Sec. 33 NE¼	A		1972
11. Buffalo Mountain	T12N R39E Sec. 15 SE¼			
12. Reese River	T13N R40E Sec. 36 NW¼	A		1972
13. Mitchell Canyon	T13N R40E Sec. 32 SE¼	A		1972
14. Spanish Ranch Canyon	T13N R40E Sec. 28 SW¼	A		1972
15. Deep Canyon	T13N R40E Sec. 3 NE¼	A		1972
16. Reese River Valley Number 2	T15N R41E Sec. 11 SE¼	A	Lander Co. Area 15	1971
17. Reese River Valley Number 2	T16N R42E Sec. 21,22,27, 28 Corner common to each	A	Lander Co. Area 15	1971

Source: Nevada Department of Fish and Game, issued February 2, 1976.

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APPENDIX H

WILD HORSES

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APPENDIX H

METHODOLOGY FOR COMPUTING ANNUAL INCREASE IN HORSES

Assume: all horses die by age 25.

- thus, average annual adult mortality is 4 percent.

1976 - 10.16 yearlings/100 adults (Green, personal communication, 1976)

1975 - 19 foals/100 adults (BLM trap data, 1975)

10.16 yearlings/100 adults (Green, personal communication, 1976)

- 4.00 adult mortality

6.16 annual increase

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APPENDIX H

PRELIMINARY DRAFT

CALCULATION METHODS RANCHING DEPENDENCE ON PUBLIC LANDS

Dependence, as used in Table IV-41, is that portion of a yearlong operation, expressed as a percentage, which is spent on, or which is dependent on, a given class of land. This is computed using animal unit months (AUM) of use rather than periods of time.

The information used to compute dependence was obtained from different sources and by different means for some users, depending upon the information available and its reliability. Knowledge of base herd size and the use of private lands (base property) was most often unknown or was incomplete. If the number of head in the base herd was unknown, it was assumed to be the largest number licensed on national resource land (NRL). When the extent of use of private lands was unknown, it was assumed either the required use of base property is made, or that the base herd is on private lands when not licensed on NRL or national forest land. The assumption thought to be most accurate was chosen.

Use on NRL was obtained either from the current or past year's license whichever represents "normal" grazing use by the individual more accurately.

In the cases of Goicoechea, Carpenter, and M & N Livestock, where dependence was not computed, information was not available and could not reasonably be assumed or estimated. These operations are widely spread and highly variable from year to year. Goicoechea has made little use of his grazing privileges in the study area during the last several years, indicating little dependence on these privileges. Carpenter is heavily dependent on NRL and national forest land, utilizing private lands mostly during the lambing and shearing season. Complete information on M & N's operation was not available.

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APPENDIX I

VISUAL RESOURCES

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TABLE I-1
SCENERY QUALITY INVENTORY

Key Factors	Rating Criteria and Score		
Land Form a/	Vertical or near vertical cliffs, spires, highly eroded formations, massive rock outcrops, severe surface variation. - 4	Steep canyon walls, mesas, interesting erosional patterns, variety in size and shape of land forms. - 2	Rolling hills, foothills, flat valley bottoms. - 1
Color b/	Rich color combinations variety or vivid contrasts in the color of soil, rocks, vegetation or water. - 4	Some variety in colors and contrast of the soil, rocks and vegetation, but not dominant. - 2	Subtle color variations, little contrast, generally muted tones. Nothing really eye-catching. - 1
Water c/	Still, chance for reflections or cascading white water, a dominant factor in the landscape. - 4	Moving and in view or still but not dominant. - 2	Absent, or present but seldom seen. - 1
Vegetation d/	A harmonious variation in form, texture, pattern, and type. - 4	Some variation in pattern and texture, but only one or two major types. - 2	Little or no variation, contrast lacking. - 1
Uniqueness e/	One of a kind or very rare within region. - 6	Unusual but similar to others within the region. - 2	Interesting in its setting, but fairly common within the region. - 1
Intrusions f/	Free from aesthetically undesirable or discordant sights and influences. - 2	Scenic quality is somewhat depreciated by inharmonous intrusions but not so extensive that the scenic qualities are entirely negated. - 1	Intrusions are so extensive that scenic qualities are for the most part nullified. - 4

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A= 15=24 B = 10-14 C = 1-9

NOTES: Explanation of Rating Criteria

a/ Land Form or topography becomes more interesting as its gets steeper and more massive. Examples of outstanding land forms are found in Grand Canyon, the Sawtooth Mountain Range in Idaho, the Wrangle Mountain Range in Alaska, Rocky Mountain National Park, etc.

b/ Color. Consider the overall color of the basic components of the landscape (i.e., soil rocks, vegetation, etc.) as they appear during the high use season. Key factors to consider in rating "color" are variety, contrast, and harmony.

c/ Water is that ingredient which adds movement or serenity to a scene. The degree to which water dominates the scene is the primary consideration in selecting the rating score.

d/ Vegetation. Give primary consideration to the variety of patterns, forms, and texture created by the vegetation.

e/ Uniqueness. This factor provides an opportunity to give added importance to one or all of the scenic features that appear to be relatively unique within any one physiographic region. There may also be cases where a separate evaluation of each of the key factors does not give a true picture of the overall scenic quality of an area. Often it is a number of not so spectacular elements in the proper combination that produces the most pleasing scenery -- the uniqueness factor can be used to recognize this type of area and give it the added emphasis it needs.

f/ Intrusions. Consider the impact of man-made improvements on the aesthetic quality. These intrusions can have a positive or negative aesthetic impact. Rate accordingly.

Instructions to Bureau of Land Management personnel using this chart are:

Purpose: To rate the aesthetic quality of the scenic resource on all BLM lands.

How to Identify Scenery Value: All Bureau lands have scenic value.

How to Determine Minimum Suitability: All BLM lands are rated for scenic values. Also rate adjacent or intermingling non-BLM lands.

How to Delineate Rating Areas: Consider the following factors when delineating rating areas:

1. Like physiographic characteristics (i.e., land form, vegetation etc.)
2. Similar visual patterns, texture, color, variety, etc.
3. Areas which have a similar impact from intrusions (i.e., roads, structures, mining operations, or other surface disturbances).

SOURCE: BLM Manual 6310, Visual Resource Inventory and Evaluation.

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APPENDIX I

VISUAL RESOURCE CONTRAST RATING METHODOLOGY

The visual contrast created by a management activity can be measured by determining the contrast caused by that activity in each of the basic elements.

The ease of detecting contrast in the basic elements varies on a scale from 4 (form) to 1 (texture). By assigning values that indicate degree of contrast, 3 for strong, 2 for moderate, and 1 for weak, we can set up a direct multiplier for an indication of the strength of the contrast.

Elements		Degree of Contrast	
Form	- 4	3	- Strong
Line	- 3	2	- Moderate
Color	- 2	1	- Weak
Texture	- 1	0	- None

The contrast rating is applied to each of the types of features in the landscape separately. That is, a contrast vegetation, and for the structures. The ease of detection for each element is

PRELIMINARY DRAFT

multiplied by the degree of contrast and the results are added to get a total score.

A total score for each feature of 1-10 indicates the contrast can be seen, but does not attract attention; 11-20 attracts attention--the contrast begins to dominate the characteristic landscape; 21-30 demands attention, will not be overlooked.

The example rating sheet shows the contrast scores for one component of the proposed action, fences, within one landscape character type: mountains-canyons. The score sheet table shows all scores calculated for each component within the three characteristic landscape types.

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VISUAL RESOURCE CONTRAST RATING SHEET

Project: Management Facilities - Fences

Landscape Character Type: Mountain - Canyons

	Element	Contrast	Score	Maximum Score Possible
Land Form Features	Form - 4 X	0	0	
	Line - 3 X	1	3	
	Color - 2 X	0	0	
	Texture- 1 X	0	0	
	Total Land Form Feature Score		3	30
Vegetation Features	Form - 4 X	1	4	
	Line - 3 X	3	9	
	Color - 2 X	2	4	
	Texture- 1 X	1	1	
	Total Vegetation Feature Score		18	30
Structures Features	Form - 4 X	3	12	
	Line - 3 X	3	9	
	Color - 2 X	2	4	
	Texture- 1 X	1	1	
	Total Structures Feature Score		26	30
			47	90

Individual Feature Scores:

1-10: Indicates contrast can be seen, but does not attract attention.
11-20: Attracts attention, the contrast begins to dominate the characteristic landscape.
21-30: Demands attention, will not be overlooked.

Degree of Contrast:

Strong	- 3
Moderate	- 2
Weak	- 1
None	- 0

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Note: Refer to Bureau of Land Management Manual 6230 for complete explanation of the contrast rating system.

VISUAL RESOURCE CONTRAST RATING SHEET

Project: Management Facilities - Fences

Landscape Character Type: Mountain - Canyon

Element		Contrast	Score	Maximum Score Possible
Land Form Features	Form - 4 X	0	0	
	Line - 3 X	1	3	
	Color - 2 X	0	0	
	Texture- 1 X	0	0	
	Total land form Feature Score		3	30
Vegetation Features	Form - 4 X	1	4	
	Line - 3 X	3	9	
	Color - 2 X	2	4	
	Texture- 1 X	1	1	
	Total Vegetation Feature Score		18	30
Structure Features	Form - 4 X	3	12	
	Line - 3 X	3	9	
	Color - 2 X	2	4	
	Texture- 1 X	1	1	
	Total Structures Feature Score		26	30
			47	90

Individual Feature Scores:

1-10: Indicates contrast can be seen, but does not attract attention.

11-20: Attracts attention, the contrast begins to dominate the characteristic landscape.

21-30: Dominate attention, will not be overlooked.

Degree of Contrast:

Strong
Moderate
Weak
None

Refer to Bureau of Land Management Manual 8430 for complete explanation of the contrast rating system.

TABLE 3-2
VISUAL CONTRAST RATING SCORES

Components Of Proposed Action	Valley Bottoms				Alluvial Fans-Foothills				Mountains-Canyons			
	Land-form	Vegeta-tion	Struc-tures	Total	Land-form	Vegeta-tion	Struc-tures	Total	Land-form	Vegeta-tion	Struc-tures	Total
razing Systems	6	17	10	33	6	15	10	31	10	23	10	43
anagement Facilities												
Fences	26	19	27	72	23	27	27	77	1	18	26	48
Wells-Windmills	27	27	24	78	26	27	25	78	25	23	27	75
Wells-Pumpjacks	20	25	17	62								
Spring Developments	27	24	17	68	20	24	17	61	20	24	12	56
Water Troughs	24	27	10	61	27	28	10	66	20	28	10	58
Underground Pipelines	20	27	14	61	24	27	24	66	20	27	24	61
Water Storage Tanks	28	30	19	77	28	30	19	77	22	30	19	71
Cattleguards	28	30	12	70	26	30	18	74	25	23	16	64
and Treatments												
Spray Only	16	26	10	52	13	26	10	49				
Spray and Seed	23	30	26	79	22	30	26	78				
Chain and Seed					23	27	27	77				

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APPENDIX J

CULTURAL RESOURCES

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APPENDIX 3

CULTURAL RESOURCE INVENTORY

TONOPAH GRAZING ENVIRONMENTAL STATEMENT

In order to establish a research strategy to obtain inventory data on the Tonopah resource area, probabilities of occurrence of cultural resources were developed using Bureau of Land Management (BLM) data on vegetative types, degree of slope, and the presence of springs and other permanent surface waters. U.S. Geological Survey maps were used to supplement the water data. The following probability categories were defined:

1. Very High - presence of surface water, any vegetative type or slope gradient.

2. High - near surface water, vegetative types of pinyon juniper, sage species or grass and a slope of less than 30 percent. Any area within one mile of surface water was listed as high, regardless of slope or vegetation.

3. Medium - same as above but not near surface water (vegetative types of pinyon/juniper, sage species or grass and slope less than 30 percent).

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4. Low - other vegetative types not near surface water or slope over 30 percent.

These probability areas have been delineated on overlays. The original plan was for district range personnel to write Allotment Management Plans (AMPs) on each grazing allotment prior to the cultural resource inventory. Intensive or extensive surveys would then be done on all proposed range improvements. For example, those developments in Very High probability areas would be intensively surveyed; those in other areas would be extensively surveyed using a stratified random sampling design. The exact percentage of each development (seeding, fence, etc.) in High, Medium, and Low probability areas extensively surveyed would depend on the total number of acres involved for the resource area. These percentages had to be feasible given time and manpower.

However, the AMPs were incomplete when the cultural resource inventory began. Therefore, the district archaeologist checked all known springs on national resource land (NRL) for cultural resources. The decision to sample 100 percent of the known springs was based on:

1. These are the areas of highest impact by livestock grazing as well as the areas of highest probability of having cultural resources.

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2. Any spring with sufficient flow would probably be proposed for development or redevelopment.

3. Such a survey was feasible for the Tonopah resource area since there are few springs on NRL.

The inventory data is based on a non-random sample of Very High probability areas, because of the time factor explained above. The data collected includes:

1. The location of sites vis a vis spring,
2. Temporally diagnostic artifacts,
3. Condition of sites,
4. Environmental data on vegetation, soil, etc.,
5. The sites were rated using the BLM Cultural Resource Evaluation System (CRES).

Overlays have been compiled giving approximate site locations and symbol and color coding site type and rating. These overlays are available at the BLM Battle Mountain District Office.

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APPENDIX J

CULTURAL RESOURCES REPORT

(Tonopah Study Area)

CR Report:

BLM 6-1	(P)	(NAS/Rusco)	Big Smoky Valley materials pit for Nevada Highway Department
6-2	(P)	(BLM/Hatoff)	Little Fish Lake Valley chainings
6-3	(P)	(BLM/Hatoff)	Various springs, gravel pits, and soil study plots
6-5	(P)	(BLM/Lee)	Basil twist pipeline
6-6	(N)	(BLM.Rowley)	Stone Cabin reservoir fence
6-7	(N)	(BLM/Rowley	Italian Spring trough horse trap
6-8	(N)	(BLM/Rowley)	Two mile horse trap
6-9	(N)	(BLM/Rowley)	Haws Canyon pipeline horse trap
6-10	(P)	(BLM/Lee)	U.T.A. Millett Ranch Inc., N-5759
6-12	(N)	(BLM/Adams, Rowley)	Smoky Valley Mining Co. 12 KV electrical extension, N-11040
6-17	(N)	(BLM/McGonalge)	Round Mountain 12 KV powerline and phone line relocation, N-11814 & N-11845
6-18	(N)	(BLM/McGonagle)	Ivan Nanny 12.5 KV extension, N-10909
6-19	(N)	(BLM/McGonagle)	Essie May Campbell lot, N-5360 & N-3689
6-21	(P)	(NSM.Tuohy)	State Highway Department materials site, Jett Canyon
6-22	(P)	(BLM/Adams, Rowley, & McGonalge)	Nevada Bell right of way N-10672
6-27	(P)	(NSM/SPPC-Harrigan)	Sierra Pacific Power Co., Silver King Mining Co. 60 KV line, #75-NV-078
6-28	(P)	(BLM/McGonagle)	Bell Telephone Co., Hanks phone line, N-12260
6-29	(P)	(BLM/McGonagle)	USAF Booker Mountain radio site, N-6276
6-30	(N)	(BLM/McGonagle)	Highway 6 reservoir horse trap
6-32	(P)	(NAS-DRI/Brooks)	Archaeological report on the central Nevada test site, Nye County, Nevada
6-33	(P)	(BLM/McGonagle, Ballantyne)	Tonopah dump site
6-35	(P)	(BLM/McGonagle)	Bill well fence
6-36	(N)	(BLM/McGonagle)	Nye County equipment site
6-37	(PO	(BLM/McGonagle)	Gravel Sale, Standard Slag
6-38	(N)	(SPPC-NSM/Harrigan)	12.5 KV electric service line to Cameron Mining Co. south of Round Mountain
6-39	(p)	(BLM/McGonagle)	Carl Haas pipeline, N-12835
6-42	(N)	(BLM/Ball)	Railroad Valley oil well clearance
6-43	(N)	(BLM/Ball)	Trap Spring No. 1 Wildcat well access road clearance lease N-10118
6-46	(P)	(BLM/McGonagle et al.)	Tonopah environmental statement
6-47	(N)	(BLM/Ballantyne)	Moores Creek gravel sale
6-51	(N)	(BLM/Ballantyne)	Gravel sale, highway pit to Wildcat Oil Co. (Trap Spring - NW pipeline)

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APPENDIX J

CULTURAL RESOURCES REPORT

(Tonopah Study Area)

5-181 (N)	(AA/Kenney)	Field reconnaissance of Lake Tonopah
5-205 (P)	(NAS/Brooks)	An archaeological inventory along 40 miles of proposed fence line construction along the north boundary of the Nellis Air Force Range in Nye County

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NOTES: Reports prefixed by the number 6 pertain to the Battle Mountain District. Reports prefixed by the number 5 pertain to the Las Vegas District.

(P) indicates positive report, i.e. cultural resources were found.
(N) indicates negative report.

Abbreviations used in the report are: BLM (Bureau of Land Management), NSM (Nevada State Museum), NAS-DRI (Nevada Archaeological Survey, Desert Research Institute), AA (avocational archaeologist), SPPC (Sierra Pacific Power Company).

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APPENDIX K

MINERALS

APPENDIX K

Minerals Areas

For information regarding the present situation, see the following maps:

1) Mineral Ownership
2) Minerals Inventory - Locatables
3) Minerals Inventory - Leasables and Saleables
4) Mineral Leasing

The following is a list of mineral areas within the Esmeralda County portion of the study area:

Mickspot Mine (antimony) T6N, R38E, Sec. 15
Crow Springs, Royston (turquoise, perlite, silver, lead, copper, gold, diatomaceous earth) T4-5N, R39E
Gilbert (gold, silver, copper, lead, turquoise, mercury) T3-4N, R38E
Coaldale (coal) T2N, R37E
Rock Hill (copper, molybdenum, fluorite, tungsten, iron, turquoise) T3-4N, R36E
Blackhorse (tungsten, barite, molybdenum) T2N, R34E
Dicalite Plant (diatomite) T2N, R33-34E
Lone Mountain (silver, lead, copper, gold, zinc, turquoise) T1-2N, R39-41E
Klondyke (silver, lead, gold, copper, turquoise) T1N, R42-43E

The following is a list of the mineral areas within the Nye County portion of the study area with their map code numbers listed first:

SE-1-3 Tybo (lead, silver, zinc, gold) T5-7N, R49-50E
SE-1-1 Page Mine (antimony) T8N, R49E
NE-32-1 Titus Prospect (antimony) T10N, R52E
SW-4-1 Manhattan (gold, silver, antimony, mercury) T7-8N, R43-44E
NW-37-1 Union (gold, silver, mercury, fluorine, lead, zinc, copper) T11-13N, R39E
NW-36-5 Round Mountain (gold, silver, tungsten, molybdenum) T9-10N, R44-45E
NW-36-3 Twin River (gold, silver, tungsten, antimony, lead) T10N, R40E, and T8-13N, R42E
NE-32-4 King Solomon Antimony Prospect (antimony) T9N, R46E
NE-32-2 Morey (silver, gold, antimony, lead) T9N, R36E
NW-37-4 Athens (lead, silver, gold, copper, tungsten, mercury, turquoise) T8-9N, R37-39E
NW-37-6-A Lodi (tungsten, silver, lead, gold) T13N, R36E
NW-37-6-B Mammoth (magnesium, iron, gold, lead, silver, mercury, tungsten) T11-13N, R36-38E

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SW-3-1 Royston (copper, turquoise, silver, lead, gold, mercury, molybdenum) T5-6N, R38-40E
SW-4-2 Longstreet (gold, silver) T5-6N, R47E
SE-8-7 Reveille (silver, lead, gold, antimony, copper, tungsten) T2N, R51-52E
SW-4-3 Last Chance Group (silver, lead, zinc) T6N, R45E
SW-4-4 San Antonio (silver, gold, molybdenum, copper, lead, manganese) T5-6N, R41-42E
SW-4-4a Hall Property (copper, molybdenum, silver) T5N, R41-42E
SE-8-6 Silverbow (silver, gold, lead) T1N, and T1S, R49E
SW-5-1 Ellendale (gold, silver, barite) T3N, R46-47E
SW-4-5 Peg Leg and North Star Properties (tungsten) T3-4N, R42-43E
SE-8-5 Eden (gold, silver) T1N, R50E
SE-8-4 Golden Arrow (gold, silver) T2N, R48E
SE-8-2 Clifford (gold, silver T3N, R49E
SE-8-1 Arrowhead (silver, gold, lead) T3N, R51-52E
SW-5-2 Tonopah (silver, gold, lead, tungsten, copper, molybdenum, mercury, kaolin) T2-3N, R42-43E
SE-2-4 Willow Creek (gold, silver, fluorine) T2-4N, R55-56E
SE-2-2 Troy (tungsten, gold, silver, zinc, lead, copper) T6-7N, R57E
SE-2-1 Silverton (silver) T8N, R54E
SE-1-5 Warm Springs (barite) T4N, R50E
SW-5-3 Hannapah (gold, silver) T3-4N, R44-45E
SE-8-3 Bellehelen (silver, gold, copper) T2-3N, R49-50E
NE-32-3 Danville (silver, gold) T11N, R49E
SE-1-4 M&M Mine (mercury) T5N, R49E
SE-1-2 Lunar Crater (cinders) T6-7N, R52-53E
SE-2-3 Butterfield Marsh (sodium) T7N, R56E
NW-37-3 Nye and Esmeralda Counties (diatomite)
NW-36-8 Darrough Hot Springs Known Geothermal Resource Area T11N, R42-43E
NE-2-A Eagle Springs Oil Field (oil) T9N, R57E

PRELIMINARY DRAFT

Commodity Trends - Present and Future Production Potentials in the Study Area:

Barite - Major production of barite ($BaSO_4$), used in barium chemicals and drilling muds, is now occurring in Northumberland Canyon in the Toquima Range. Barite prospects have also been found at Warm Springs.

Antimony - Several small deposits exist in the study area. Some production may be expected in the future.

Fluorspar - Recent production has occurred in the Union District and the Willow Creek District. There is potential for renewed production.

Gold - Some operations are occurring at Manhattan and Round Mountain. Exploration is taking place on other prospects.

Lead - Lead has been mined from the Union District and Tybo. The mining of otherwise uneconomical deposits may be possible because of the association of lead with silver.

Magnesium - Magnesite $MgCO_3$, and Brucite, $Mg(OH)_2$, are mined in quantity at Gabbs. The outlook for future production is good.

Oil - Production is occurring at the Eagle Springs oil field. Production to July 31, 1976, totaled 3,031,888 barrels (with 10 operating wells).

Turquoise - Mines in the study area have produced large amounts of turquoise in the past and some are beginning production again.

Zeolites - Zeolites (hydrated aluminosilicates used in industry) are found near Tonopah and in the southern Monitor Range. Though not likely to be mined on a large scale in the near-future, the long-term future for production of zeolites is good. A shallow pit mining procedure would probably be used.

Geothermal Steam - A Known Geothermal Resource Area (KGRA) has been designated at Darrough Hot Spring in Big Smoky Valley. The potential for geothermal energy development within the study area is good.

PRELIMINARY DRAFT

APPENDIX L

SOCIAL-ECONOMICS

PRELIMINARY DRAFT

TABLE L-1

NORTHERN NYE COUNTY SCHOOL ENROLLMENT[a/]

	Special Ed.	Kindergarten	Elementary	High School	Total 1976	Total 1975
Duckwater			7		7	7
Gabbs	33	13	71	101	218	220
Round Mountain			39		39	30
Tonopah	26	20	155	223	424	459
Yomba			17		17	15

a/ Enrollment is for the tenth month of each school year and was supplied by Mr. Joaquin Johnson, superintendent.

PRELIMINARY DRAFT

TABLE L-2
NUMBER OF AUMs BY ALLOTMENT AND NET INCREASE
TONOPAH STUDY AREA

Allotment	Proposal Beginning Year 1	Proposal Objective Year 15	Net Increase
Blue Eagle	978	1,722	744
Butterfield	2,206	2,670	464
Nyala	10,400	16,157	5,757
Reveille	14,400	21,791	7,391
Hot Creek	16,825	27,606	10,781
Wagon Johnnie	4,447	5,442	995
Stone Cabin	10,559	15,244	4,685
Ralston-Monitor	13,685	18,557	4,872
Hunts Canyon	2,906	3,890	984
Francisco	720	1,299	579
Darrough Hot Springs	1,150	1,150	0
Ione	6,929	11,632	4,703
San Antone-Smoky	15,322	28,778	13,456
Willow Creek	858	1,321	463
Total	101,385	157,259	55,874

PRELIMINARY DRAFT

TABLE L-3
ESTIMATION OF RANCH REVENUES DUE TO GRAZING
IMPROVEMENTS AFTER FULL IMPLEMENTATION

Average Price Per 100 lbs. Received
By Farmers, Nevada, 1970-74

Year	Dollars
1970	33.50
1971	35.60
1972	44.40
1973	54.80
1974	33.70
Total	202.00
Five Year Average	40.40

Source: United States Department of Agriculture, Statistical Reporting Service, Agricultural Statistics.

ASSUMPTIONS:

75 percent calf crop

325 pound calf weights

3 percent death loss

CALCULATION:

3,862 X 325 lbs. = 1,255,150/100 lbs. = 12,551.5 cwt. X $40.40 = $507,080.60 per year after the 15 years of the proposal.

PRELIMINARY DRAFT

TABLE L-4
REVENUES FROM GRAZING
THROUGH IMPLEMENTING THE
PROPOSAL, YEARLY AND CUMULATIVE

Year of Implementation	Per Year (Dollars)	Cumulative* (Dollars)
1	$33,875.40	33,875.40
2	"	67,750.80
3	"	101,626.20
4	"	135,501.60
5	"	169,377.00
6	"	203,252.40
7	"	237,127.80
8	"	271,003.20
9	"	304,878.60
10	"	338,754.00
11	"	372,629.40
12	"	406,504.80
13	"	440,380.20
14	"	474,255.60
15	"	508,131.00

*May vary from the estimated amount due to rounding.

PRELIMINARY DRAFT

Industry	Earnings ($1,000)	Export Related Earnings ($1,000)	Import Related Earnings ($1,000)	Industry Income Multiplier
Agriculture				
Livestock (except dairy-poultry)	2,075	1,623		1.103
Other agriculture	835		231	1.028
Mining				
Metal	4,974	4,432		1.118
Fossil fuels	88	36		1.054
Quarrying	142	72		1.067
Contract construction	4,135	1,989		1.063
Manufacturing				
Food and kindred products	136		805	1.004
Lumber and wood products			174	1.000
Other manufacturing	501		6,433	1.017
Transportation and communication	1,006		762	1.034
Public utilities	310		273	1.010
Wholesale and retail trade	2,244		2,164	1.079
Finance, insurance, and real estate	496			1.000
Services	6,684	3,824		1.076
Recreation				
Government				
Federal	3,536	3,536		1.132
State and local	3,314			1.000
District summary	30,476	15,512	11,405	.132

Source: United States Department of the Interior, Bureau of Land Management, Denver Service Center, June 1973.

Industry	Earnings ($1,000)	Export Related Earnings ($1,000)	Import Related Earnings ($1,000)	Industry Income Multiplier
Agriculture				
Livestock (except dairy-poultry)	2,075	1,025		1.103
Other agriculture	855		231	1.058
Mining				
Metal	4,014	4,432		1.118
Fossil fuels	28	30		1.052
Quarrying	145	72		1.047
Contract construction	4,158	1,369		1.063
Manufacturing				
Food and kindred products	136		805	1.004
Lbr and wood products			174	1.000
Other manufacturing	301		6,433	1.017
Transportation and communications	1,000		702	1.034
Public utilities	810		275	1.010
Wholesale and retail trade	2,744		4,164	1.079
Finance, insurance, and real estate	406			1.000
Services	6,084	3,454		1.075
Government				
Federal	3,330	5,456		1.332
State and local	3,318			1.000
Primary Economy	30,470	16,512	11,466	1.132

Source: Natural Sector Impact Model of the Interior, Bureau of Land Management, Denver Service Center.

TABLE L-6
ESTIMATION OF TAX REVENUES DUE TO GRAZING
IMPROVEMENTS AFTER FULL IMPLEMENTATION

Beef Cattle	Assessed Value Not Less Than a/
Range Bulls	$161.00 per head
Cows (2 yrs. and older)	89.00 per head
Heifers (1 to 2 yrs.)	68.00 per head
Steers (1 yr. and older)	74.00 per head
Weaned Calves (6 mo. to 1 yr.)	52.00 per head
Purebred Cows	161.00 per head

a/ Normal charge is approximately 35 percent of assessed valuation and not more than a five percent tax rate.

Source: State of Nevada, Nevada Tax Commission, Instructions for Assessment, Bulletin No. 133, Carson City, July 1974.

CALCULATION:

Bulls	279 X	$161.00 = $44,919 X	.05 =	$2,245.95
Cows	5,308 X	89.00 = 472,412 X	.05 =	23,620.60
Weaners	3,862 X	52.00 = 200,824 X	.05 =	10,041.20
		Additional Tax Revenues =		35,907.75

PRELIMINARY DRAFT

F-7

TABLE L-7
TAX REVENUES, YEARLY
AND CUMULATIVE

Year of Implementation	Per Year (Dollars)	Cumulative* (Dollars)
1	$2,399.05	$ 2,399.05
2	"	4,798.10
3	"	7,197.15
4	"	9,596.20
5	"	11,995.25
6	"	14,394.30
7	"	16,793.35
8	"	19,192.40
9	"	21,591.45
10	"	23,990.50
11	"	26,389.55
12	"	28,788.60
13	"	31,187.65
14	"	33,586.70
15	"	35,985.75

*May vary from the estimated amount due to rounding.

PRELIMINARY DRAFT

TABLE L-8
AUM LICENSED USE
BATTLE MOUNTAIN DISTRICT
CATTLE AND HORSES, 1960-75

Year	Regular Nonuse	Active Use	Total Licensed	Percent Change
1975	93,049	358,881	451,930	+ 14
1974	79,235	317,451	396,686	- 12
1973	136,762	314,923	451,685	+ 7
1972	91,247	331,490	422,737	+ 2
1971	90,196	324,379	414,575	+ 2
1970	91,463	316,437	407,900	+ 3
1969	92,654	302,194	394,848	- 5
1968	90,445	327,283	417,728	- 17
1967	108,936	394,698	503,634	+ 24
1966	99,547	306,485	406,032	+ 2
1965	105,314	294,634	399,948	- 3
1964	139,013	275,087	414,100	0
1963	179,615	235,933	415,548	0
1962	184,294	231,254	415,548	- 8
1961	229,679	220,613	450,292	0
1960	207,379	242,913	450,292	

TABLE
AUM LICENSED USE
TONOPAH STUDY AREA
CATTLE, 1974-75

Year	Nonuse	Active Use	Total Licensed
1975	20,155	109,394	129,549
1974	24,164	99,972	124,136
Change			
1975/1974 +	- 4,009	+ 9,422	+ 5,413
1975/1974 Percent	- 17%	+ 9%	+ 4%

PRELIMINARY DRAFT

Year	Regular Horses	Active Use	Total Licensed	Percent Change
1975	93,049	388,801	481,850	+ 14
1974	79,215	317,871	396,086	- 12
1973	136,703	314,313	451,016	+ 7
1972	91,247	331,450	422,697	+ 2
1971	89,199	324,379	414,579	+ 2
1970	81,465	319,417	407,900	+ 3
1969	83,854	305,194	394,848	- 3
1968	80,145	337,253	417,758	- 17
1967	108,956	194,099	503,851	+ 24
1966	99,547	306,466	406,013	+ 2
1965	105,314	314,824	397,388	0
1964	159,013	175,987	414,300	0
1963	179,615	236,023	415,638	0
1962	164,284	271,254	419,546	- 2
1961	159,679	290,813	450,292	0
1960	207,310	242,814	450,124	

Year	Horses	Active Use	Total Licensed
1975	20,135	109,364	129,499
1974	24,104	95,075	119,179
Change			
1975\1974 +	- 4,009	+ 9,489	+ 5,313
1975\1974 Percent	- 17%	+ 9%	+ 4%

TABLE L-1

GRAZING AUM USE
NO ACTION ALTERNATIVE

Allotment	Year 1	Year 15	Net Increase (Decrease)
Blue Eagle	978	1,222	244
Butterfield	2,206	1,989	(217)
Nyala	10,400	10,688	288
Reveile	14,400	21,791	7,391
Hot Creek	16,825	17,253	428
Wagon Johnnie	4,447	2,369	(2,078)
Stone Cabin	10,559	11,145	586
Ralston-Monitor	13,685	16,338	2,653
Hunts Canyon	2,906	2,710	(196)
Francisco	720	958	238
Darrough Hot Springs	1,150	1,150	0
Ione	6,929	10,392	3,463
San Antone-Smoky	15,322	15,922	600
Willow Creek	858	858	0
Total	101.385	114,785	13,400

Assumptions:

75 percent calf crop
325 lbs. calf weight
3 percent death loss
1:20 Bull - cow ratio

926 x 325 lbs. = 300,950 / 100 lbs. =
3,009.5 cwt x $40.40 = 121,583.80

PRELIMINARY DRAFT

TABLE L-10.

TAX REVENUE CALCULATION
NO ACTION ALTERNATIVE

Bulls	67	X	$161.00	=	10,787	X .05	=	$ 539.35
Cows	1,273	X	89.00	=	113,297	X .05	=	5,664.85
Weaners	926	X	52.00	=	48,152	X .05	=	2,407.60
					Additional Tax Revenues		=	$8,611.80

PRELIMINARY DRAFT

Borrower's Card

TONO
.37
EAR
v.2

Tonopah Study Area Grazing Environmental Statement.

Date Loaned	Borrower	Division	Date Ret'd

DSC 1279-3a (Feb. 1977)

BUREAU OF LAND MANAGEMENT
Library
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